FRANKLY SPEAKING
Don't blame H-1Bs for the drop in computer science enrollments, says Frank Hayes. **PAGE 54**

ON THE MARK
Mark Hall writes about one way to make Vista rollouts saner. **PAGE 12**

COMPUTERWORLD

THE VOICE OF IT MAN[illegible] T[illegible]UTERWORLD.COM

APRIL 9, 2007 • VOL. 41 • NO. 15 • $5/COPY

SPECIAL REPORT The Lean Storage Machine

Companies are saving **huge amounts of data,** but when it comes to storage systems — **slim is in.** Read how leading companies use technologies that **save space, energy and money.** PAGE 27

NEWSPAPER

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Microsoft Defends Effort to Patch Flaw

IT execs, researchers split over pace of work on ANI fix

BY GREGG KEIZER AND JAIKUMAR VIJAYAN

Microsoft Corp. first learned of an animated cursor flaw in Windows on Dec. 20 — more than 100 days before it released an emergency patch last week to block active attempts to exploit the vulnerability.

The head of the software vendor's security research laboratory defended the time it took to investigate the flaw and then develop and test the fix. Some IT managers are giving Microsoft the benefit of the doubt. But that feeling isn't universal.

Hugh McArthur, director of information systems security at Online Resources Corp. in Chantilly, Va., said that in general, Microsoft's 100-day turnaround time for patching the so-called ANI vulnerability doesn't seem all that unusual.

It wasn't as if the software vendor was "just sitting back and doing nothing," McArthur said. "My take is that Microsoft was hoping they could get the fix written and tested prior to an exploit being written. In this case, they didn't make it."

"I don't know if 100 days is good or not," said David Jordan, chief information security officer for the Arlington County government in Virginia. Jordan said that he "would like to have higher expectations" for Microsoft, since it's the largest software vendor in the world.

But, he added, he isn't sure that's a reasonable expectation because there is little credible data available on the average amount of time that it takes vendors to develop patches.

Less charitable toward Microsoft was Oliver Friedrichs, director of Symantec Corp.'s security response team.

ANI Patch, page 52

INSIDE

Companies need **multiple layers** of security defenses to help stop zero-day attacks, users and analysts say. **PAGE 52**

Malware distribution is starting to look more like a regular online business. **PAGE 13**

Thin Clients Get Microsoft's Approval – for Some Users

New licenses limited to SA customers

BY ERIC LAI

Once an avowed opponent of thin clients, Microsoft Corp. has made an about-face in recent years. And last week, the company brought its affair with network computing into the open, revising two previously ambiguous software licenses related to the streaming of Windows from servers to thin-client hardware.

But the changes favor subscribers to Microsoft's Software Assurance maintenance and upgrade program, and some IT managers and Microsoft business partners said the revised licenses could add significant costs for non-SA users and smaller organizations. The potential new costs could be enough to make desktop virtualization financially unviable for some of those users.

> **"Why should Microsoft charge us more just because we're running Windows off a server?"**
>
> **LEE STEINSDOERFER,** IT MANAGER, ZION-BENTON TOWNSHIP HIGH SCHOOL

"If they went after us, we'd probably have to drop the [streaming] product," said Lee Steinsdoerfer, technology director at Zion-Benton Township High School in Zion, Ill. The school is replacing its 700 desktop PCs with thin clients — essentially PCs without hard drives. End users will get Windows and their applications streamed to them from five central servers running software from Ardence Inc.

Technically, all Microsoft customers who stream Windows are supposed to buy a

Thin Clients, page 16

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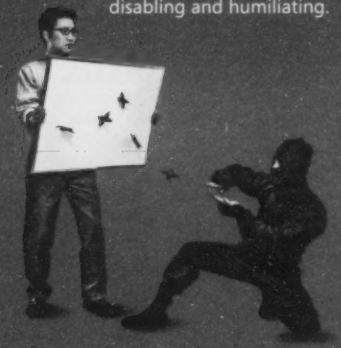
2. Find a weapon, any weapon.
There's no doubt Ninjas are deadly. In an office setting, however, their Ninja skills are at a disadvantage. Use what's at hand to take them by surprise. Hot coffee flung at a Ninja will get his attention. Or simply dump your wastebasket on his head—both disabling and humiliating.



3. Use your whiteboard as a shield.
Ninjas love throwing stars, known as *shuriken*. They are sharp, and pointy, and when thrown they stick in deep and hurt a lot. Grab the nearest whiteboard and use it as a shield when the *shuriken* throwing begins. Yes, it'll ruin the whiteboard, but you can explain later.

4. Use your phone (to call for help).
Ninjas are tough—deadly actually—and no one will judge if, at a point when all hope seems lost, you call for help. Calling in reinforcements from branch offices, even the warehouse crew, can make the difference when Ninjas attack.

5. Use office plants as weapons.
Those dusty-looking palms around your office may look harmless, but you can wield them as formidable weapons. The fronds can be used as pokers; aim for the Ninja's sensitive spots. Cacti are particularly useful for the Ninja-besieged enterprise. Throw them, pot and all, like grenades.

6. Attack Ninja with a stapler.
Ninjas, like most of us, hate being stapled. It hurts bad, and can daze you a little. Keep a well-oiled stapler in every office (two in conference rooms). Very few Ninjas, no matter how tough, can handle multiple bites from a well-swung Swingline.®

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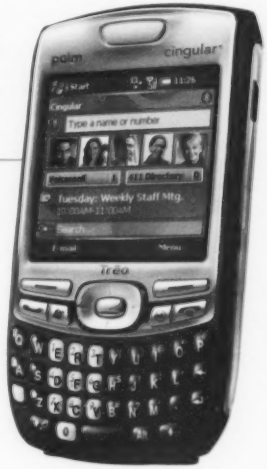

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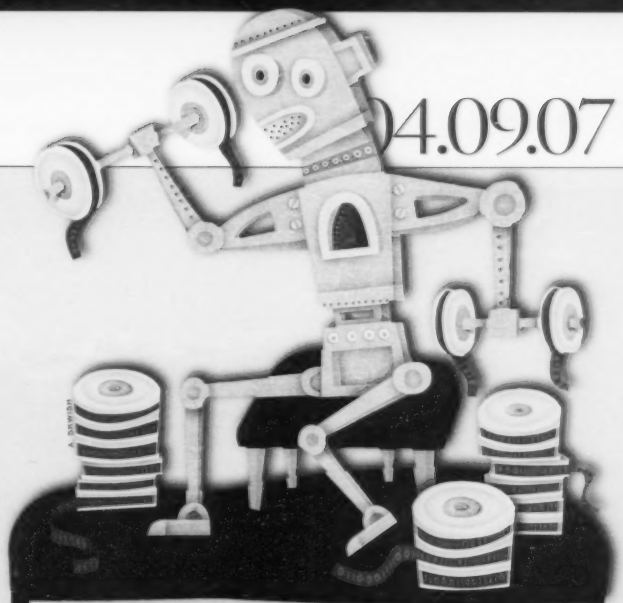

KNOWLEDGE CENTER STORAGE

The Lean Storage Machine

Editor's Note: Data stores might be chubby, but when it comes to storage systems, slim is in. **Package begins on page 27.**

SPECIAL REPORT

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40 Next-Gen Storage. The newest storage technologies — solid-state disk, high-density disks, hybrid hard drives and storage resource management software — endeavor to save both energy and space.

46 Opinion: More Data? Get Used to It. Some in the industry argue that CIOs will emerge from a global storage crisis as more powerful executives inside their companies. Mark Hall disagrees.

ONLINE EXCLUSIVES

The following stories can be found at Computerworld.com.

Opinion: **Columnist Steve Duplessie says "green" isn't just about building disk arrays out of reusable tinfoil. The fact is, you can no longer buy your way out of inefficient systems.**

Survey results: **In *Computerworld*'s exclusive survey of 121 IT managers, 79% of the respondents said they will be purchasing storage products and services in the next year, and the majority of this spending will be on storage hardware. See the full results.**

Executive briefing: **Storage virtualization is helping companies mask storage complexity and simplify management. This report offers deployment tips, insights into emerging technologies and advice from storage experts.**

Conference: **Starting next week, you can read exclusive survey results, stories and blogs from *Computerworld*'s Storage Networking World conference, April 16-19 in San Diego.**

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BLOG SPOTLIGHT

Getting a DRM Clue

The entertainment industry ranks right up there with airlines when it comes to abusing its best customers, says blogger Eric Ogren. The announcement that EMI's digital music can be purchased DRM-free at Apple's iTunes store is a big change. But why now?

www.computerworld.com/blogs/node/5299

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COMPUTERWORLD.COM THIS WEEK

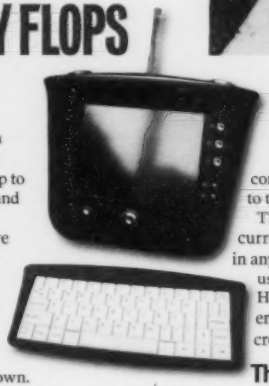
STEPHEN WEBSTER

THE 21 BIGGEST TECHNOLOGY FLOPS

Vote for your favorite failure

Hype is the coin of the realm in the technology business. Some products and services do live up to all the fuss, but many don't — and some fail spectacularly.

Computerworld's editors have nominated 21 of their favorite overhyped failures, presented in alphabetical order. At the end of the piece, we'll ask you to vote on which is the biggest tech flop of them all, or write in a nominee of your own. Among those nominated:



The Pets.com sock puppet is an enduring symbol of dot-bomb-era advertising excess, while 3Com's Audrey (left) represents the failed Net PC market.

Beenz and other Internet currency schemes were simply bad ideas. The Apple Newton, on the other hand, was arguably ahead of its time.

Apple Newton

Why did the Newton flop? One reason was the ridicule heaped on it by talk show comedians and comic strips (most notably "Doonesbury"), which focused on the supposed inaccuracy of the handwriting recognition.

Also, Newton was expensive. And it was arguably ahead of its time. Still, before it faded away in 1998, Newton paved the way for PDAs, which led, in turn, to today's smart phones.

E-books

Great in theory, but there are too many formats, and right now, most devices just aren't good enough yet.

Internet currency

Remember Flooz and Beenz? These two Internet-bubble vendors provided online currency, which many dot-com proponents thought would lead to the wild success of e-commerce.

The idea was to create an "Internet currency" that was not legal tender in any particular country but could be used to purchase items on the Web. However, it turned out that consumers preferred to use real money and credit cards.

The Net PC

Net PCs consisted of a screen, a keyboard and a pointing device, but had little built-in intelligence. They were designed to be placed unobtrusively throughout the home, providing a simple user interface for Web and e-mail access.

The problem: Net PCs were introduced just as the prices of more intelligent desktop PCs were plummeting.

Read about the other nominees and cast your vote at www.computerworld.com/07/flops.

SHARK BAIT BETA

Shark Bait is the place to post your experiences on all things IT – the good, the bad and the downright crazy things you deal with every day. Post your tales and comment on others at http://sharkbait.computerworld.com.

How Not to Reboot a Computer

This IT veteran works for a police department with a 24-hour communications center. At 2 a.m., he gets an urgent call from a dispatcher requesting assistance with a computer that has frozen up and won't respond. What could possibly be the problem?
http://sharkbait.computerworld.com/?q=node/605

From Our Knowledge Centers

Word 2007 Cheat Sheet

Microsoft Word's new interface is likely to confound veteran Word users. Here's everything you need to know to make the switch.
www.computerworld.com/software

Real-World Advice for Office 2007 Deployment

NETWORKING: Jonathan Hassell points out the real-world side effects and unintended consequences of rolling out Microsoft's new office suite.
www.computerworld.com/networking

Five Cheap, Easy Ways to Turbocharge Your PC

HARDWARE: Try one or two of these tips, and your PC will run more efficiently. You might even be able to put off buying a new machine.
www.computerworld.com/storage

What's on Tony Soprano's Laptop?

SECURITY: The TV crime boss is no fan of technology, but in 2007, it's hard to run a business (even a family business) without one. Columnist Jon Espenschied ponders the security issues involved in keeping a connected guy connected.
www.computerworld.com/security

Why Your Next Phone Will Be a Wallet

MOBILE & WIRELESS: Are you ready to get rid of your wallet? The technology is here; the vendors and banks are ready. The only remaining barrier is consumer acceptance.
www.computerworld.com/mobilewireless

Four Things to Know About Longhorn Terminal Services

SERVERS: Columnist Jonathan Hassell takes you through the new gateway, remote programs and other new features.
www.computerworld.com/servers

Review: Macs in a Wireless World

MACINTOSH: If you're a systems administrator who needs to look after the occasional Mac and wants to do so from within Active Directory, Centrify's Direct Control may be the program for you.
www.computerworld.com/servers

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AT DEADLINE

Software AG Agrees To Buy webMethods

Software AG has agreed to buy webMethods Inc. in a cash deal valued at $546 million. Darmstadt, Germany-based Software AG said the acquisition will bolster its service-oriented architecture offerings and help it increase business in North America. Software AG said its North American customer base is less than half that of webMethods. The deal is expected to close by the end of June.

Oracle's EMEA Users Cancel Conference

The EMEA Oracle User Group Council canceled its OUC 2007 conference scheduled to begin May 3 at the RAI Conference Center in Amsterdam. It declined comment on the cancellation. An official of Oracle Corp.'s French-speaking user group speculated that the Europe, Middle East and Africa group was struggling to attract attendees.

VeriSign to Increase Prices for .com, .net

VeriSign Inc. has announced plans to increase the wholesale cost of registering .com and .net domain names in October. VeriSign said the increased revenue will be used to pay for infrastructure improvements. The increases are the first of several VeriSign is allowed to impose through 2012 under an agreement with the Internet Corporation for Assigned Names and Numbers, which oversees the Internet's addressing system.

Mozilla Adding Web 2.0 Tools to Firefox

Mozilla Corp. has unveiled a proof-of-concept prototype that would add social networking features to Firefox. Called "The Coop," the project would let users of the open-source browser share photos, news stories and links with others; track friends' contributions to YouTube and blogs; share photos stored with services such as Flickr; and swap sites they have tagged.

Colorado DMV Puts Brakes On $13M Registration System

Faulty data was delivered to police at traffic stops

BY TODD R. WEISS

SEVEN MONTHS after it was deployed by the Colorado Department of Motor Vehicles (DMV), a $13 million vehicle title and registration system was shut down last week because of data transfer irregularities that have led to the retrieval of inaccurate data.

The new system, called the Colorado State Titling and Registration System (CSTARS), was built to replace the green-screen distributed data processing (DDP) vehicle registration system first used in the state in 1983.

The state implemented the system on a limited basis in September to speed transactions and training for new workers as well as modernize the department's infrastructure, said Pat Chase, DMV project manager for CSTARS.

Old System Blamed

Since the system's deployment, however, some police and motorists have complained that inaccurate registration data in CSTARS sometimes caused problems when vehicles were stopped for traffic or code violations, said Roxanne Huber, executive director of the Colorado Department of Revenue, which oversees the DMV.

Officials said the problems occurred because inaccurate motor vehicle data is sometimes transferred from the old system to the new one.

CSTARS is based on Microsoft Corp.'s .Net technology, while the old DDP system was developed using Micro Focus Ltd.'s implementation of Cobol, Chase said.

Huber said that CSTARS was shut off last Monday and that the agency will use only the legacy DDP system until the problems are resolved.

"We couldn't have people out there having their cars impounded" because of incorrect information in the CSTARS database, Huber said.

The state hired Avanade Inc., a Seattle-based consulting firm formed by Microsoft and Accenture Ltd., to build and implement the system.

A spokesman for Avanade declined to comment on the data compatibility problems. "We're working with [the DMV] to see how we're going to pursue all this," he said.

CSTARS had been used only by personnel at the state's main DMV office. The older system remained in place at the department's 108 regional facilities spread through 64 counties, Huber said.

The agency had held off on installing the new system at the regional sites until officials were sure it worked as promised, she said.

> **We think CSTARS is going to be part of the future, but that's part of the risk assessment.**
>
> MAREN RUBINO, OPERATIONS DIRECTOR FOR TITLES AND REGISTRATION, COLORADO DMV

The DMV has missed several deployment deadlines, Chase said, noting that the agency had initially expected that the system would be fully operational by now.

So far, Huber said, the state has spent about $10.6 million of the $13 million allotted for the new system.

Chase said that the DMV is working to clean the legacy data so it can work with CSTARS in the future.

At the same time, he said, the agency is undertaking a risk assessment study to determine how and when to move ahead with the overall project.

Maren Rubino, the agency's operations director for titles and registration, said the risk assessment effort is expected to take about six weeks. Once the report is completed, officials will evaluate its contents for about three months, said Rubino. "We think CSTARS is going to be part of the future, but that's part of the risk assessment," she said.

The old DDP system was slated to be replaced because it is based on technologies that are no longer supported and the DMV wanted to take advantage of emerging products. "The DDP system was running on proprietary hardware that was no longer being supported" by its original hardware vendors, Chase said.

"We also wanted to use current technologies and get ahead of the curve," he said. ▸

CA to Unveil New Workload Automation Family

BY MATT HAMBLEN

CA Inc. today is set to unveil a new line of job scheduling tools that includes a Web portal and four updated offerings.

The new CA Workload Automation family includes mainframe and distributed tools from CA and the former Cybermation Inc., which CA acquired in May 2006, said Jim Anderson, director of workload product management at CA.

Geo Velasquez, production control manager at United Parcel Service Inc. in Atlanta, said his company will automatically upgrade to the new product line's CA ESP Workload Automation 5.5, previously known as Cybermation ESP.

Velasquez said that ESP has been his company's key job scheduling tool since 1994.

UPS has 15 mainframes in two data centers located in Atlanta and Mahwah, N.J., and nearly 9,000 servers to manage, according to its Web site.

Velasquez said he hopes that updated versions of the tool include easier links from the ESP tool to other CA products that UPS has deployed, such as a notification manager tool.

Anderson said he expects such an interface to be included in the next ESP release, which is slated to be unveiled later this year.

As a longtime Cybermation customer, Velasquez said he likes the workload management technology but has "only started to get a feel for CA's methodology and support."

CA said pricing for the new line starts at $25,000, but it has not publicly disclosed the cost of each product.

Anderson said CA Workload Control Center r11, an updated version of CA's older UniCenter Enterprise Job Manager product, is a key member of the new product family. The updated job scheduling tool adds several new features, including a new enterprise reporting function as well as a customizable workflow management tool for monitoring and controlling workloads and enterprise management capabilities, he said.

The Workload Automation line also includes CA AutoSys Workload Automation r11, which provides workload automation in distributed environments, and CA ESP Workload Automation 5.5 for managing workloads across mainframes.

CA-7 r11 is a mainframe-focused workload automation tool that has added Web services capabilities.

CA today will also announce plans for a new sales channel that will extend the potential customer base for the CA dSeries Workload Automation products, previously known as the Cybermation dSeries line.

The dSeries distributed systems product, traditionally aimed at large companies, targets companies with annual revenues of between $300 million to $1 billion, according to Anderson. ▸

Government IT Execs Call for Standardized Vista Rollouts

White House, California county look to coordinate deployments of new OS

BY PATRICK THIBODEAU

The White House sees Windows Vista as an opportunity to move all of the federal government's PCs to a standard security configuration. Meanwhile, on the other side of the country, the IT director for California's Monterey County views Vista upgrades by individual users as a potential danger to his systems.

Despite differences in tone, recent memos from IT officials in Washington and Monterey delivered fundamentally similar messages: Vista rollouts will take a lot of planning and coordination.

Karen Evans, who sets federal IT policy as administrator of e-government and IT at the White House Office of Management and Budget (OMB), said last week that deploying a new operating system opens the door to improved security management on PCs. For instance, adopting standard security settings for Vista will allow automated patching of systems to "the maximum extent possible," she said.

Weeding the Garden

"If we don't take and seize upon this opportunity to standardize, a thousand flowers will bloom, and we'll be back to where we were," said Evans, meaning that federal agencies will be left to manage a variety of PC security configurations.

In a memo sent to agency IT heads last month, Evans said standardized configurations are needed to improve the overall security and reliability of the government's PCs. Clay Johnson, the OMB's deputy director for management, wrote in a separate memo that it is critical for agencies "to ensure [that] a very small number of secure configurations are allowed to be used."

Agencies have until next February to adopt common security settings developed jointly by the National Institute of Standards and Technology (NIST), several other agencies and Microsoft Corp. The directive applies to both Vista and Windows XP, and it requires software vendors to ensure that their products can work well with the new standard configurations.

But that doesn't mean the White House is looking to stop Vista deployments. Evans indicated that, to the contrary, the OMB is giving agencies a green light to upgrade to the new operating system.

"I think it's a big catalyst," said Jeff Parker, an analyst at Directions on Microsoft in Kirkland, Wash. Parker added that the secure configuration mandate should be particularly good news for Microsoft and other vendors, which can tell agencies, "Maybe you can figure out how to do it yourself, but we can get it done now."

> HANG TOGETHER
>
> "An unauthorized installation [of Vista or Office 2007] could cause severe problems not unlike those presented with a malicious computer virus attack. Therefore, individual upgrades must not be permitted until formal [software] compatibility testing is successfully completed."
>
> FROM A MEMO WRITTEN BY VIRGIL SCHWAB, DIRECTOR OF IT FOR MONTEREY COUNTY

Virgil Schwab, Monterey County's IT director, said uncoordinated installations of Vista present "a real danger of business interruption unless compatibility with other applications is assured."

Many of the county's 4,000 PCs and laptops don't have the system memory, CPU power or video card capabilities to support Vista, Schwab said. New drivers are still needed to run video displays, printers and other peripherals, he added. Moreover, some of the county's applications need to be updated by their vendors to work with Vista's new security features. On top of all that, training materials for Schwab's technical staff and end users aren't ready.

The warning from Schwab about not moving to Vista in anything less than a well-planned process isn't a first. For instance, the U.S. Department of Transportation earlier this year put a moratorium on upgrades to Vista, Office 2007 and Internet Explorer 7 because of a combination of technical issues and the agency's plan to move to a new headquarters in July.

Simon Szykman, NIST's CIO, said his agency has begun studying what it will take to upgrade to Vista. NIST already has its own secure configuration policy, Szykman noted. "As a concept, it's not new to us," he said. "What's new in general is this governmentwide mandate."

Nearly 500 IRS Laptops Lost or Stolen Over Three Years

Audit also finds unencrypted data of taxpayers on 44 laptops now in use

BY LINDA ROSENCRANCE

Nearly 500 Internal Revenue Service laptops — many likely containing unencrypted personal information of taxpayers — were lost or stolen over a 30-month period ending in June 2006, according to an audit released last month.

The audit, conducted by the Treasury Inspector General for Tax Administration, found that between Jan. 2, 2003, and June 13, 2006, a "large number" of laptops were stolen from the vehicles and homes of IRS employees, while 111 were stolen from various agency facilities.

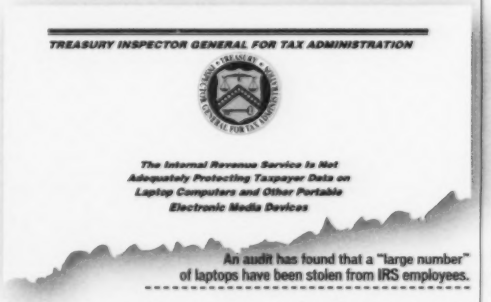
Although auditors were unable to determine exactly what information was contained on the missing laptops, they did conclude that personal information of taxpayers is not adequately protected.

"We conducted a separate test on 100 laptop computers currently in use by employees and determined 44 laptop computers contained unencrypted sensitive data, including taxpayer data and employee personnel data," the report said.

Repeat Performance

The audit noted that similar findings were reported in July 2003. Since then, it said, "the IRS had not taken adequate corrective actions."

In a statement e-mailed to *Computerworld*, IRS Commissioner Mark Everson said that protection of taxpayer data is a top priority of the IRS and that the agency has moved aggressively in this area since this issue was raised last year.


TREASURY INSPECTOR GENERAL FOR TAX ADMINISTRATION
The Internal Revenue Service Is Not Adequately Protecting Taxpayer Data on Laptop Computers and Other Portable Electronic Media Devices
An audit has found that a "large number" of laptops have been stolen from IRS employees.

"The IRS has vast amounts of taxpayer data," he said in the statement. "Our systems have extensive protection from outside penetration."

The statement also said that the IRS is unaware of any identity theft cases stemming from the loss of laptops.

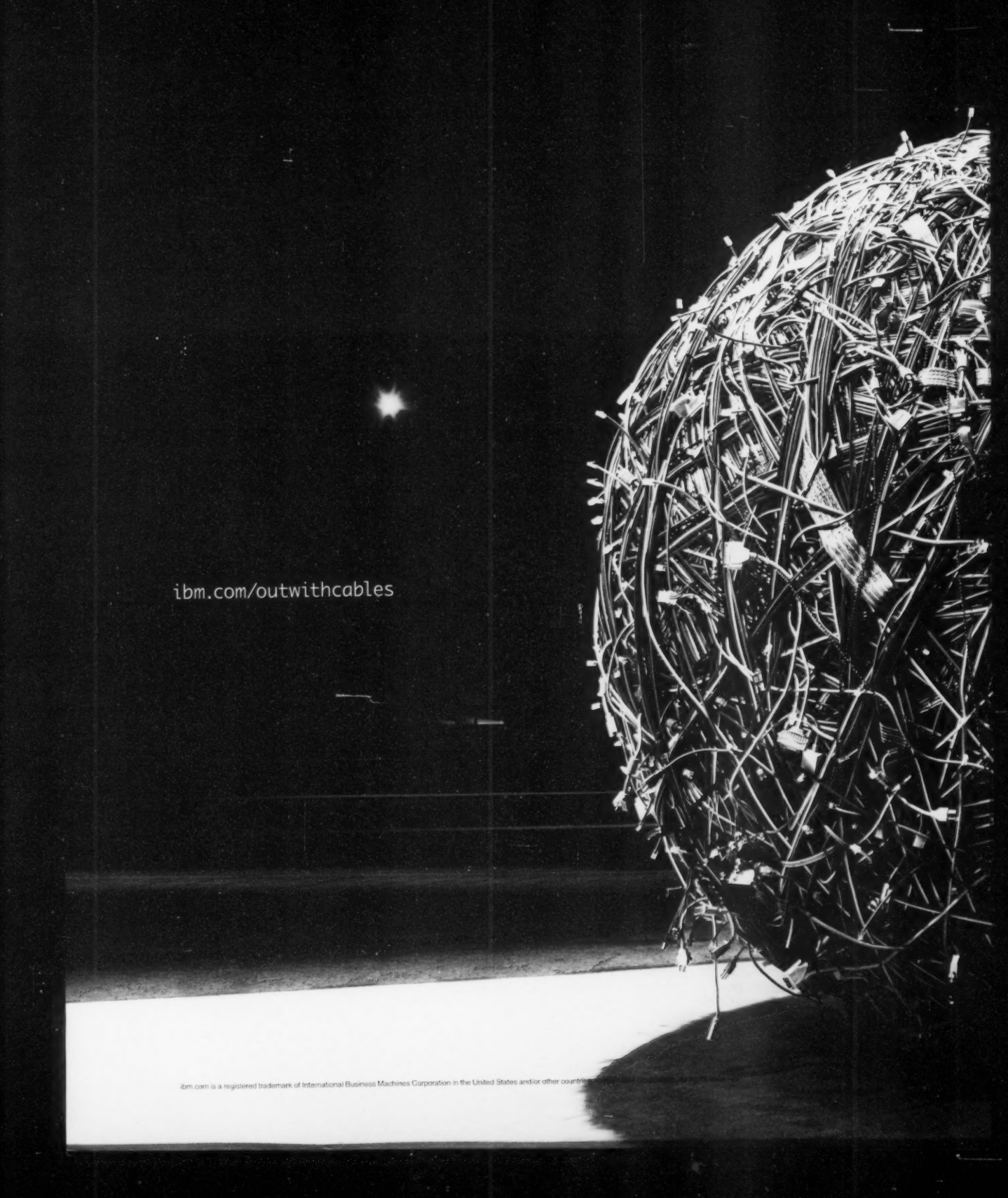
However, Everson acknowledged that the report correctly identified past problems concerning IRS laptops.

"These laptops, which typically have very limited data, had been routinely but not always encrypted," he said.

Also, Everson said, "historically, missing laptops were treated by us and [the inspector general's office] as a loss of IT hardware rather than as a potential loss of taxpayer data or personally identifiable information. Clearly, this was not the proper response.

"When a laptop is missing, the process now assesses the potential information affected as well as the hardware loss," he said. "We have emphasized employee training as well as focusing on reporting incidents and increased accountability."

In a written response to the report, Richard Spires, CIO of the IRS, said that aggressive steps have been taken to mitigate the risk of potential identity theft or other criminal activity. He noted that his organization is working to ensure that all IRS employees can encrypt sensitive files and e-mails on their computers. The IRS is also working to deploy full disk-encryption technology on all employee laptops and install physical cable locks on the machines, Spires said.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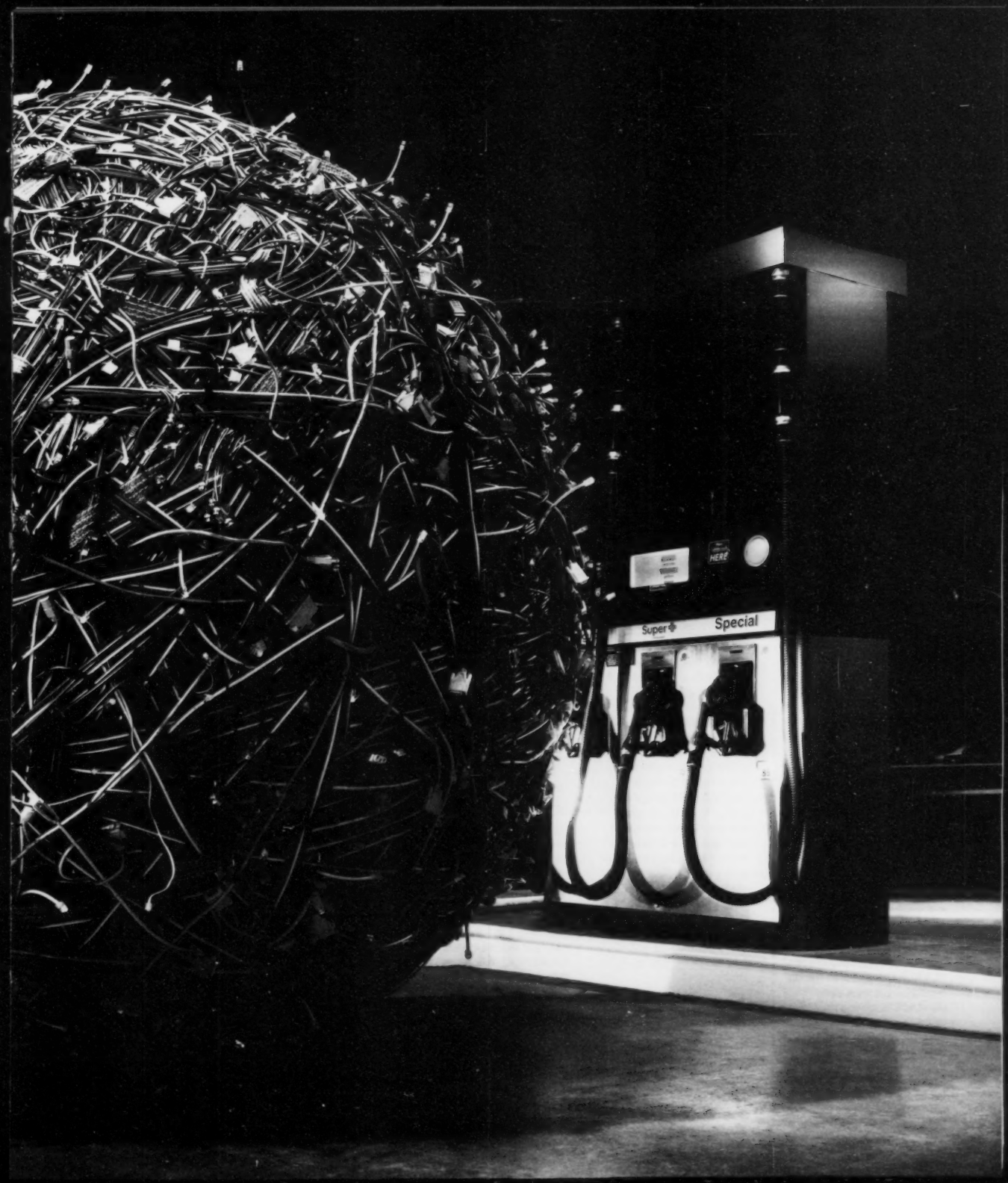

Super
Special

BRIEFS

H-1B Requests Surge Past Limit in One Day

The federal government ran out of H-1B visas last week, reaching the 65,000 limit on the first day that the U.S. Citizenship and Immigration Services began accepting applications. The agency received about 150,000 requests for guest worker visas by Monday afternoon. The visas will be issued Oct. 1, at the start of the 2008 federal fiscal year. Any applications received from this point on will be rejected.

KKR to Purchase First Data for $29B

Private equity firm Kohlberg Kravis Roberts & Co. has agreed to buy First Data Corp. for $29 billion in cash. First Data provides payment products and services to help merchants and financial institutions validate and process payments. The agreement allows First Data to seek more bids for the company over the next 50 days. If that effort is unsuccessful, KKR expects the deal to close in the third quarter.

CSC Discloses 62 Federal Contracts

Computer Sciences Corp. said it signed previously undisclosed contracts valued at $1.29 billion with the U.S. government during the first quarter of 2007. The 62 contracts included 28 with civil agencies valued at $811 million and 34 with military agencies valued at about $474 million. CSC will provide outsourcing, consulting and systems integration services under the pacts.

IBM Donation to Aid Efforts in Iraq

IBM has announced plans to donate 10,000 copies of its speech translation software, along with 1,000 laptop and handheld computers to run it, to the U.S. government for use in humanitarian efforts in Iraq. IBM said that about 160 of its employees have served in the U.S. military in Iraq or Afghanistan and told the company about the need for better communications.

ON THE MARK

HOT TECHNOLOGY TRENDS, NEW PRODUCT NEWS AND INDUSTRY BUZZ BY MARK HALL

MATTHEW FAULKNER

Don't Let Vista Deployment . . .

. . . drive you nuts. That might be tough, given that Gartner Inc. estimates that half of the PCs in companies today can't run Microsoft Corp.'s new operating system. Wes Wasson, vice president of worldwide marketing at Citrix Systems Inc. in Fort Lauderdale, Fla., suggests that you "can manage the rollout of Vista saner" by distributing it virtually to desktops from centralized servers. He says Citrix's Desktop Server 1.0, available this week, will let CIOs "rethink how Vista can get to users." With Desktop Server, Wasson claims, IT can customize delivery of Vista to end users, whether they need simple access to applications or are hard-to-please power users who push the operating system to its limits. Desktop Server starts at $75 per user per year. Might be a bargain if you value your sanity.

WASSON: Save your sanity during Vista migration.

'Applications don't just break . . .

. . . they degrade over time.' And that's much worse, says Amal Chaudhuri, president of SignaCert Inc. in Portland, Ore. You immediately notice when an app fails, he says, but a decaying one is "insidious," slowly becoming less secure, losing performance and falling out of compliance. Chaudhuri explains that apps degrade as changes are made to the underlying infrastructure, such as the operating system and drivers, and the application itself. Protect yourself, he advises, by keeping track of all the "signatures" — that is, configurations and states — of the various infrastructure components so you can see how they have changed. SignaCert Global Trust Services does just that, he claims. It combines an online service that maintains a database of 80 million signatures of all commercial operating systems, drivers, databases and the rest with an appliance that you install in your data center. The appliance monitors changes to your environment and lets you compare them with a known time when an app was running at peak levels, so you can return to that state if necessary. Subscriptions start at $99 per year per server. SignaCert change monitoring will be integrated in the next release of the Solaris operating system, which is due early next year, Chaudhuri says.

Protect against insidious app decay, warns CHAUDHURI.

Old webcasts and podcasts . . .

. . . won't just fade away. Ever wonder what happens to online broadcast events after they're over? Not much, actually. According to Tom Masotto, vice president of business development at San Franciso-based ON24 Inc., which produces webcasts and podcasts for companies (including IDG, the parent of *Computerworld*), 80% of the people who watch them do so live, with the remaining 20% catching them in the following week. After that, the virtual events vanish into the bowels of corporate Web sites. Masotto thinks that's a pity, since there's still plenty of good technical and business information in them, not to mention the usual exhortations to buy something. And so, ON24 this week is unveiling Insight24, a Web site where you can find more than 1,000 rich media presentations on dozens of topics — everything from systems management to servers and operating systems to outsourcing. Masotto says any company can submit an event, but ON24 vets each webcast for appropriateness. Drop by *www.insight24.com* for a screening, but bring your own popcorn.

12k
Webcasts produced in 2006 by ON24, according to the company.

Rich media . . .

. . . you can't escape it. Certainly not in the future, says Bill Joll, CEO of Clifton Park, N.Y.-based On2 Technologies Inc., which is 22 numbers away from and no relation to ON24. That's because of the availability of both vast amounts of user-generated content and advanced video-compression software such as On2's VP6 technology. (Adobe Systems Inc. has licensed the technology for its Flash video products.) And if the FCC approves the release of unused broadcast spectrum for the transmission of high-speed Internet services, online video will pervade everything from your cell phone to the back seat of your car. Joll argues that the "next breakout of the video phenomenon" will arrive when companies like yours sustain online communities of customers who use video to relate their experiences with your firm's products and services. He thinks brand identification by consumers through rich media will evolve "into a different type of social networking."

2009
The year White Spaces Coalition expects devices to become available that use airwaves that the FCC is considering releasing to Internet broadcasters.

Correction: CCV adores . . .

. . . Series A investments. Through a spokesman, Mike Fitzgerald, managing general partner of Commonwealth Capital Ventures LP in Waltham, Mass. — quoted here on March 26 as "eschew[ing] most Series A investments" — says that 75% of CCV's venture funds go to such companies. Oops. Apologies to all. So, if you lack revenue and customers but have a great idea, you can knock on his door after all. ▸

Malware Outfits Put Business Gloss on Illicit IT Activities

'Managed exploit providers' offer cybercrime support services and more

BY JAIKUMAR VIJAYAN

LIKE MANY just-launched e-commerce Web sites, a security-related one that lets visitors transact business in Russian or English has a fairly functional, if somewhat rudimentary, home page. A list of links points to an FAQ section, spells out terms and conditions for using the software offered on the site, and provides details about the supported forms of payment.

But contact information is sparse — probably because the merchandise advertised on the site isn't exactly legitimate. What's available there is malicious code that webmasters with criminal intent can use to infect visitors to their sites with a spyware Trojan horse.

In return for downloading the malware to their sites, Web site owners are promised at least €50 — about $66 (U.S.) — every Monday, with the potential to get even more money for "clean installs" of the malicious code on end-user systems. "If your traffic is good, we will change rates for you," the site promises.

'Exploit Engines' for Sale

As organized gangs of crooks increasingly turn to cybercrime, Web sites like that one are coming to represent the new face of malware development and distribution, according to security researchers. They said that unlike earlier malware writers, who tended to distribute their code to tight groups of insiders or within underground newsgroups, the new breed hawks its wares in a more professional manner.

Over the past year or so, "we've been seeing a growth of highly organized 'managed exploit providers' " in countries that don't have extradition treaties with the U.S., said Gunter Ollmann, director of security strategies at IBM's Internet Security Systems X-Force unit. For subscriptions starting as low as $20 per month, Ollmann said, such companies sell "exploit engines" that spyware distributors and spammers can use to infiltrate systems worldwide.

The available exploit code is usually encrypted, uses a range of morphing techniques to evade detection by security software and can exploit various vulnerabilities, according to Ollmann. He added that many exploit providers simply wait for Microsoft Corp.'s monthly patches, which they then reverse-engineer in an effort to create new code that can take advantage of the disclosed vulnerabilities.

Don Jackson, a security researcher at SecureWorks Inc. in Atlanta, discovered one such site in January while investigating a Trojan horse called Gozi. Jackson said Gozi was designed to steal data from encrypted Secure Sockets Layer streams and send it to a server in St. Petersburg, Russia. The program took advantage of a vulnerability in the iFrame tags of Internet Explorer and had apparently been planted on hosted Web sites, community forums, social networking sites and sites belonging to small businesses.

The server in Russia held more than 10,000 records containing confidential information belonging to about 5,200 home users, Jackson said. He added that it was maintained by a group called 76Service and contained server-side code for stealing data from systems, plus administration and data-mining interfaces.

According to Jackson, criminals looking for stolen passwords, credit card numbers and other personal information could log in, view indexed data and run queries. He said each query had a price associated with it, stated in WMZ — a form of electronic currency supported by Moscow-based WM Transfer Ltd.'s WebMoney online payment system (see box).

The Gozi code itself appears to have been purchased by 76Service from a Russian hacking group called the HangUp Team. Jackson said such code typically costs about $1,000 to $2,000, depending on how sophisticated it is. Often, he added, groups such as the HangUp Team also offer a detection-monitoring service through which they keep an eye on antivirus vendors so they know when security tools can detect their malware.

"We're not talking about kids doing it for kicks over the weekend anymore," said Yuval Ben-Itzhak, chief technology officer at Finjan Inc., a San Jose-based security software vendor. "This is real cash, real money, that's involved here." ▸

Security Costs

SecureWorks researcher Don Jackson cited the following **prices for stolen data** on 76Service's Web site, based on the WMZ e-currency:

- A query that returned three stolen passwords for accounts at a small retailer might cost 100 WMZ, or about $100.
- A more-involved query that produced 10 passwords for international bank accounts could fetch 2,500 WMZ or more.

Black Hat Demos Reveal Major Flaws in Cisco's NAC

BY JAIKUMAR VIJAYAN

Two flaws in Cisco Systems Inc.'s Network Admission Control (NAC) architecture allow unauthorized PCs to be viewed as legitimate devices on a network, according to German security researchers.

A tool that takes advantage of the flaws was demonstrated at last month's Black Hat security conference in Amsterdam by Michael Thumann, chief security officer, and Dror-John Roecher, senior security consultant at ERNW GmbH, a Heidelberg, Germany-based penetration-testing firm.

The NAC technology lets IT managers set rules that prevent a client device from accessing a network unless the device complies with specific policies on antivirus software, firewalls, software patches and other issues, Cisco said.

The NAC architecture uses Cisco Trust Agent technology, which sits on each client, to determine whether a device complies with established policies. Based on the findings of the agent, a policy management server either lets the device log on to the network or puts it into a quarantine zone.

Roecher said that a "fundamental design" failure makes it possible to trick the policy server to allow any device to access a network.

"Basically, it allows anyone to come along and say, 'Here are my credentials, this is my service pack level, this is the list of installed patches, my antivirus software is current,' " he said.

Roecher said the second flaw prevents the policy server from confirming whether the information it gets from the trust agent is accurate. Therefore, he said, spoofed information can easily be sent to the policy server.

"There's a way of persuading the installed Trust Agent to not report what's actually on the system but to report what we want it to. We can spoof the credentials and gain access to the network" with a system that is completely out of compliance, he said.

Cisco didn't respond to requests for comment. But in a note posted on its Web site, the company acknowledged that it's possible to spoof information pertaining to a device's status by simulating communication between Cisco Trust Agent and its interaction with network enforcement devices.

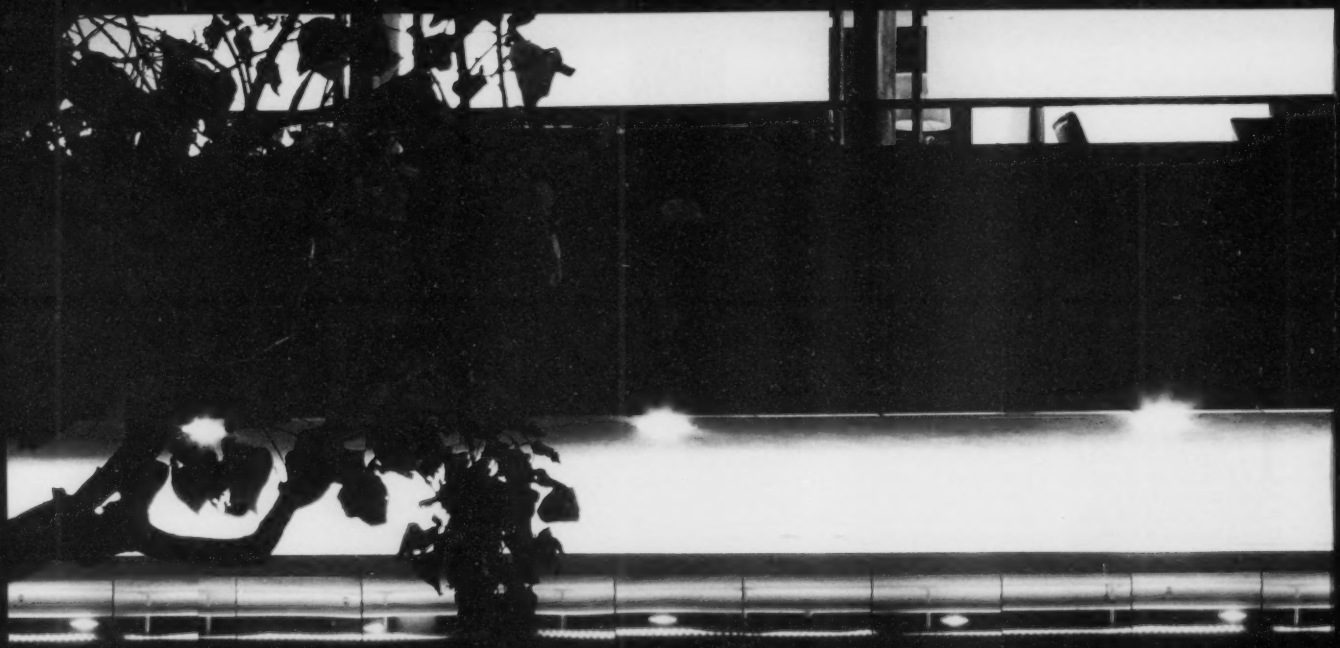
> **"There's a way of persuading the installed Trust Agent to not report what's actually on the system but to report what we want it to."**
>
> DROR-JOHN ROECHER, SENIOR SECURITY CONSULTANT, ERNW GMBH

Alan Shimel, chief security officer at StillSecure Inc., a Superior, Colo.-based firm whose products compete with NAC, said that the problems cited at the Black Hat conference may be caused by Cisco's proprietary authentication protocol. "They don't have a mechanism for accepting certificates" to authenticate devices, he said.

Shimel also noted that any agent software that lives on a machine, tests the machine and reports back to a server can be spoofed.

The NAC security problem also highlights the importance of using "postadmission" network controls along with "preadmission" checks such as NAC, said Jeff Prince, chief technology officer at ConSentry Networks Inc., a security vendor in Milpitas, Calif.

"NAC is an important first line of defense, but it is not very useful" without ways of controlling a user's action after gaining access, he said. ▸



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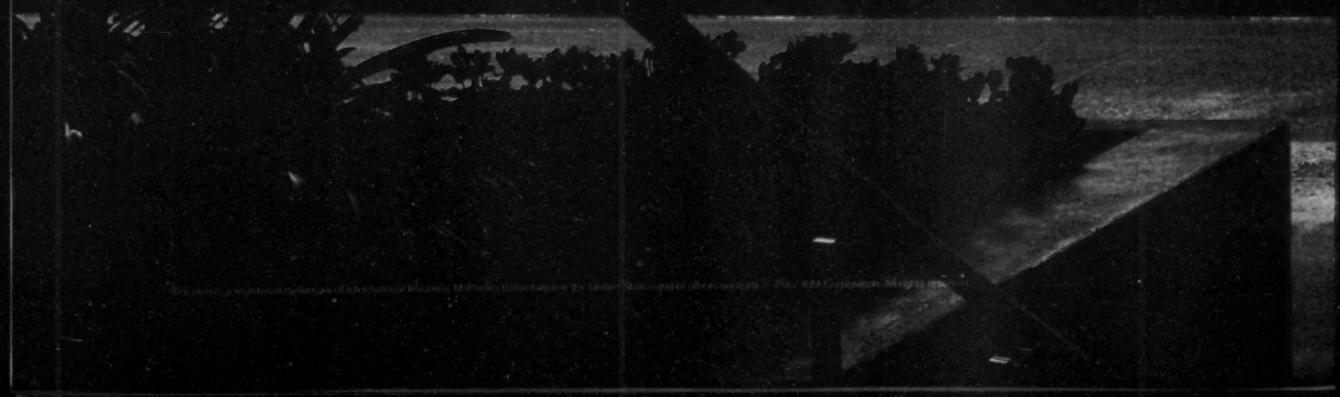

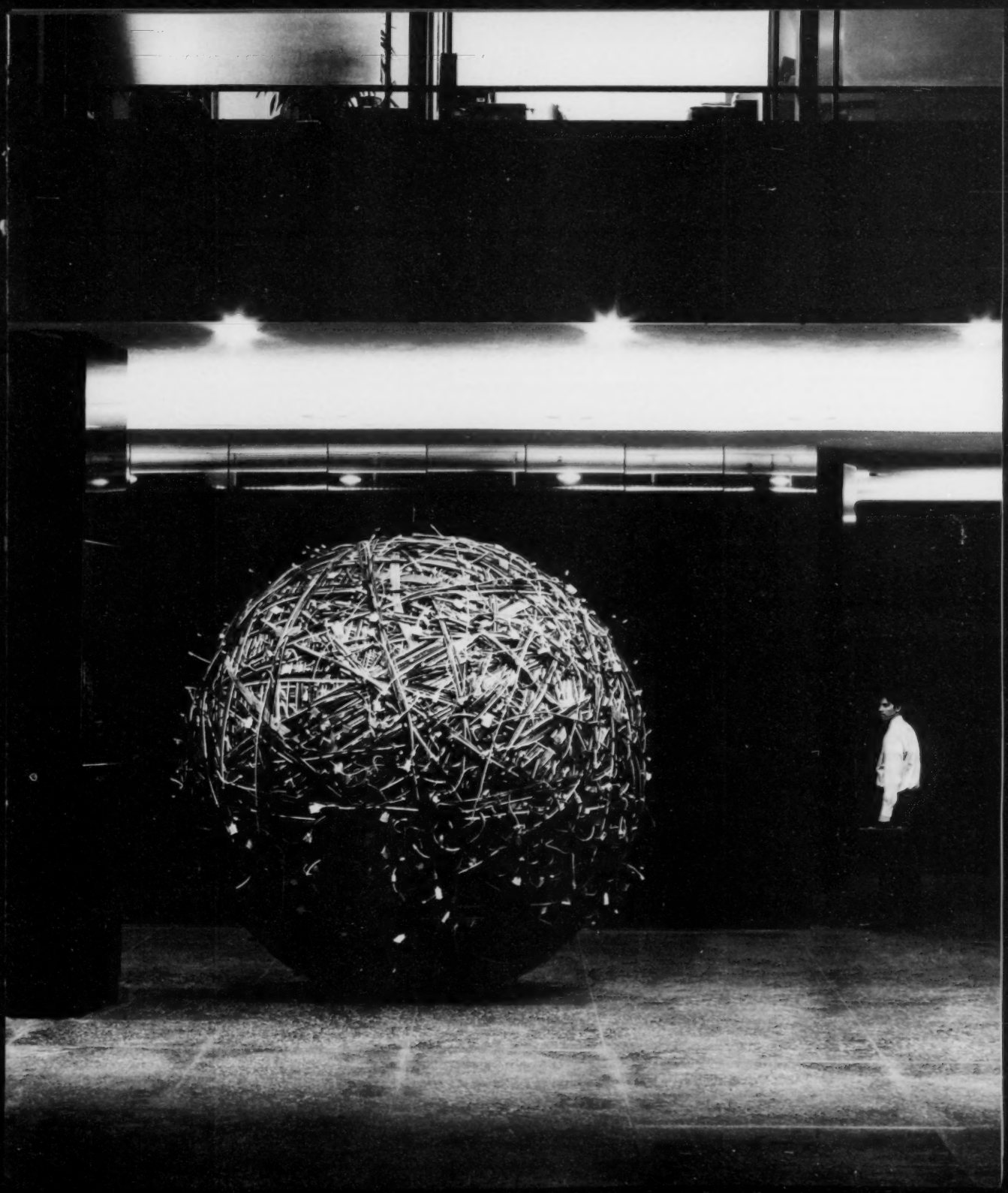

BRIEFS

Infor to Buy Toronto Software Maker

Infor Global Solutions GmbH has agreed to purchase Toronto-based online workforce management software vendor Workbrain Corp. for about $227 million in cash. Infor said it plans to use Workbrain's software to expand its human resources software line, particularly in the areas of time and attendance, scheduling, absence management and workforce planning. The deal is expected to close in June.

CEO Leaves eEye After Six Months

After slightly more than six months on the job, eEye Digital Security CEO Ross Brown has left the company, eEye confirmed. According to a source familiar with the matter, the board of directors asked Brown to leave. Kamal Arafeh, eEye's senior vice president of sales and marketing, was named to replace him. Brown was named CEO last September, about a year after joining the company as chief operating officer.

Marvell Licenses Sun Technology

Sun Microsystems Inc. is licensing its multithreaded 10GB Ethernet networking technology to Marvell Technology Group Ltd., marking the first deal since the computer maker created a separate microelectronics group last month. Marvell, a fabless semiconductor firm, will use the Sun technology in high-performance networking products.

Google Plans to Build Data Center in S.C.

Google Inc. plans to invest $600 million in a new data center in South Carolina, according to state officials. The facility will be built on a 519-acre site at the Mt. Holly Commerce Park near Charleston. The state said the center should employ about 200 people and projected that Google will make annual property tax payments of $2 million (see related story, page 18).

Continued from page 1

Thin Clients

retail operating system license for every client device that is used to access the OS. But IT managers and analysts said the software vendor hasn't enforced that requirement.

Last week, though, Microsoft declared that only organizations with SA contracts would be able to run Windows Vista Enterprise on thin clients — or "diskless PCs," as the software vendor calls them — at no extra cost beyond the standard Vista license fee.

Microsoft also said that only SA subscribers would be eligible for a new annual fee license called Windows Vista Enterprise Centralized Desktop. VECD lets companies deploy Vista in virtual machines on servers for use by both PCs and thin clients (see box).

Steinsdoerfer said Zion-Benton is too cash-strapped to subscribe to SA, which under a typical three-year contract tacks on charges amounting to 87% of the cost of Microsoft's desktop products and 75% of the cost of its server software.

And Steinsdoerfer is no fan of the idea of paying for additional Windows licenses. He noted that by simply installing hard drives on its thin clients, the school could legally run Windows at a lower cost than it might have to pay to continue streaming the operating system. "Why should Microsoft charge us more just because we're running Windows off a server?" he said.

Move to Diskless PCs

The government of Oregon's Lane County is moving 1,500 users to diskless PCs that will have Windows XP and all of their applications streamed to them from virtual machines hosted on central servers.

As part of that move, the county is negotiating its first SA agreement with Microsoft, said Brad Carpenter, a senior information systems analyst for the county. Because of the SA contract, the move to thin clients will be "almost a wash" cost-wise, Carpenter said.

Third-party vendors such as Waltham, Mass.-based Ardence, which was acquired in January by Citrix Systems Inc., and Austin-based ClearCube Technology Inc. have been offering technology for streaming Windows to client devices for several years.

But until now, "there was no licensing explicitly created by Microsoft to enable those scenarios," said Scott Woodgate, a director in the company's Windows business group. Woodgate said the new licenses are meant to make it easier to deploy streaming or virtualized infrastructures, although he added that Microsoft expects such deployments to remain "niche" applications appealing primarily to banks and other large customers.

Asked whether it plans to crack down on non-SA customers that stream Windows to thin clients, Microsoft declined to comment directly. The company said in a statement that it encourages users to take advantage of diskless PCs or virtual systems, "assuming that they have rights to Windows Vista Enterprise for each licensed device."

Brian Madden, an independent analyst in Silver Spring, Md., said the changes made by Microsoft are "a modernization of [its] license agreements so that what used to be a 'don't ask, don't tell' situation is now officially allowed."

But Madden and other analysts said Microsoft is pushing hard to get users to sign up for Software Assurance.

"SA is becoming a handy way for Microsoft to monetize," said Paul DeGroot, an analyst at Directions on Microsoft. DeGroot estimated that Microsoft garners $1 billion a year solely from companies subscribing to SA for Windows, despite the fact that he thinks customers get "very little value" for their money. ▸

SERVER-BASED WINDOWS OPTIONS

TERMINAL SERVER:

Microsoft software that lets users access applications hosted centrally on a system running Windows Server.

Requires a Windows Server Client Access License for each device or user, plus a separate Terminal Server CAL for running Windows sessions.

VISTA ENTERPRISE CENTRALIZED DESKTOP (VECD):

A new Microsoft license that lets companies host Windows in virtual machines on servers.

Available only to customers with Software Assurance contracts; Microsoft is charging an undisclosed annual license fee.

WINDOWS STREAMING VIA THIRD-PARTY SOFTWARE:

Thin-client approach built around software streaming technology from vendors such as Ardence and ClearCube.

Microsoft's modified Vista Enterprise license lets Software Assurance customers stream OS to thin clients at no extra cost; others must buy OS licenses for each device used.

Privacy Advocate Pushes to Protect Data in Public Records

BY JAIKUMAR VIJAYAN

For nearly five years, **Betty "BJ" Ostergren** *— a feisty 57-year-old former insurance claims supervisor — has led a one-person crusade to persuade county and state government officials to stop posting public records containing Social Security numbers and other personal data on their Web sites. Last month, Ostergren persuaded the secretaries of state in Colorado and Arizona to break links to some commercial and tax lien documents. And last week, she began putting public pressure on Massachusetts Secretary of State William Galvin to do the same thing. Ostergren, who lives in Virginia, spoke with Computerworld about her privacy campaign last week. Excerpts follow:*

Q&A

Are there many counties around the U.S. that are still posting public records with personal data? Yes, there are. It's stupid, it's reckless, and it's dangerous. Here's a thought: If somebody wants to see a public record, why don't they get in their car and drive down to the courthouse or the secretary of state's office? Don't be spoon-feeding criminals with stuff on the Internet.

County clerks say all they're doing is making the same records that are available in the courthouse available online. What's wrong with that? Sure, these are open records at the courthouse, as well they should be. But when we first started putting our records in these courthouses hundreds of years ago, it was for safekeeping and for different legal purposes. With the advent of the Internet, everybody wants to put all this crap online, and I just think that it's dead wrong.

So who do you think is accessing the data? Absolutely anybody and everybody can access it. People from outside this country are into these sites, and so are people from within this country. Maybe it's your neighbor down the street. A site like the Colorado secretary of state's is free and open. Anybody can just simply sign up and get a password, and in a minute you can get right in.

But some states and counties require you to pay for the records, right? A subscription is no protection. In Virginia, for $25 you can sign up to access [the Web site of] Fairfax County. I send in $25 and I get a password and a username back in three days or so, and then I'm in there sitting on 33 million records and about 5 million Social Security numbers. That's where you lose control of those records. There are people downloading them by the gazillions. ▸

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Microsoft Starts to Deliver On System Center Promises

New systems management suite takes shape as revamped tools begin to ship

BY ERIC LAI

AT ITS annual management tools conference last year, Microsoft Corp. talked up its System Center product family and tried to reassure users that its Dynamic Systems Initiative for autonomic computing was on track. Now the company is starting to deliver on its DSI promises.

Microsoft released System Center Operations Manager 2007, a rewritten version of its event and performance management software, on April 1. The other linchpin of the System Center family, Configuration Manager 2007, is scheduled to be available this summer, said Brad Anderson, a general manager in Microsoft's Windows Server division.

Company officials said at the Microsoft Management Summit 2007 in San Diego last month that Operations Manager is focused on end-to-end management of computing services and processes, not on controlling individual systems.

The new release — formerly known as Microsoft Operations Manager (MOM) — includes management packs designed to simplify setup, plus self-tuning thresholds and the ability to monitor clients with or without software agents.

Managing Priorities

Virgin Megastore USA, a 13-store music retail chain based in Los Angeles, began installing the upgraded software last October and finished rolling it out early last month. CIO Robert Fort said that before doing so, the Virgin Group Ltd. unit was using a free open-source tool called Big Brother, but only to monitor a few servers in its data center.

Fort said Operations Manager is freeing his 12-person IT team from mundane help desk tasks and enabling staffers to more closely monitor any breaks in internal processes. That helps them decide whether a problem is major — one that involves a server, for example — or a minor issue related to a point-of-sale device or music kiosk, he added.

Microsoft said future updates will add network discovery and health monitoring capabilities via EMC Corp.'s Smarts technology, under a licensing deal announced at the summit (see box).

Andi Mann, an analyst at Enterprise Management Associates in Boulder, Colo., said he's impressed by what he has seen of Operations Manager 2007. But, he added, "I'm looking to see if there really is knowledge out of the box. Implementation is always the beast."

Configuration Manager 2007 — which has also been called Version 4 of Systems Management Server (SMS), Microsoft's old name for the software — is in a Beta 2 release, managing 65,000 PCs.

Dell Inc. is using the beta version to deploy software on more than 20,000 PCs, said Takis Petropoulos, the company's IT manager for enterprise tools engineering. New features, such as a task sequencer, make Configuration Manager more flexible than SMS 2003 for installing operating system images and pushing out software updates, he said.

At the management summit, Microsoft also announced beta release plans for other System Center products, including tools for managing data protection, virtual machines and help desk processes. Those products are a part of the company's plan to create an integrated and modular line of systems management tools.

Mann said earlier versions of MOM and SMS had a reputation for being "less painful" to get up and running than infrastructure management platforms such as Hewlett-Packard Co.'s OpenView and CA Inc.'s Unicenter. But, he cautioned, that may change now that System Center is becoming "this whole family." ▸

MANAGEMENT TEAM

The following joint efforts were announced at the Microsoft Management Summit:

- Microsoft is licensing EMC's Smarts network monitoring technology, and EMC will develop add-on network management and root-cause analysis tools for System Center Operations Manager.
- Microsoft, EMC and Cisco are creating a set of IT infrastructure models to make it easier to use the Service Modeling Language, which Microsoft originally developed.

Google's $600M Data Center Plan Boosts Business in Small N.C. City

Construction has begun; company seeking workers

BY PATRICK THIBODEAU

Google Inc.'s decision to build a $600 million data center in Lenoir, N.C., (pop. 17,000) has already started to benefit the city.

Some 400 to 500 construction workers are building the data center, which is less than a mile from Lenoir's downtown. The workers are staying at local hotels, buying from local shops and visiting health and fitness facilities, P. Kaye Reynolds, the city's economic development director, noted late last month.

And once the facility opens, she said, workers are likely to patronize nearby restaurants.

Google announced plans for the facility in January. The company is already advertising for employees, including a facilities manager with experience managing a data center of 50,000 square feet or larger.

> **Others will assume that their decision is valid as well – just like Burger King going on the same corner as McDonald's.**
>
> SCOTT MILLAR, PRESIDENT, CATAWBA COUNTY ECONOMIC DEVELOPMENT CORP.

According to officials, the facility will employ about 210 people — nearly as many as the number of people who work for the city of Lenoir, which is situated between Asheville and Greensboro.

Scott Millar, president of the Catawba County Economic Development Corp., noted that Google's move could boost the region's viability as a data center location. Catawba County is adjacent to Caldwell County, where Lenoir is located.

"Others will assume that their decision is valid as well — just like Burger King going on the same corner as McDonald's," Millar said.

Catawba County is developing its own setting for data centers on a 200-acre site about 20 miles from Lenoir. The area was once known for furniture making, an industry that has taken a hit because of low-wage competition from overseas, Millar noted.

In more recent years, the county has been home to a fiber-optic industry that makes 40% of the world's supply of fiber-optic cable, he said. In 1999, about 10,000 people were locally employed in that industry, but following the dot-com bust, that number was cut in half. Employment has picked up since then, Millar said.

But he isn't assuming that Google's decision alone will be enough to draw other data centers to the area. Millar attended the AFCOM Data Center World conference in Las Vegas late last month to make contacts and tout the virtues of his region.

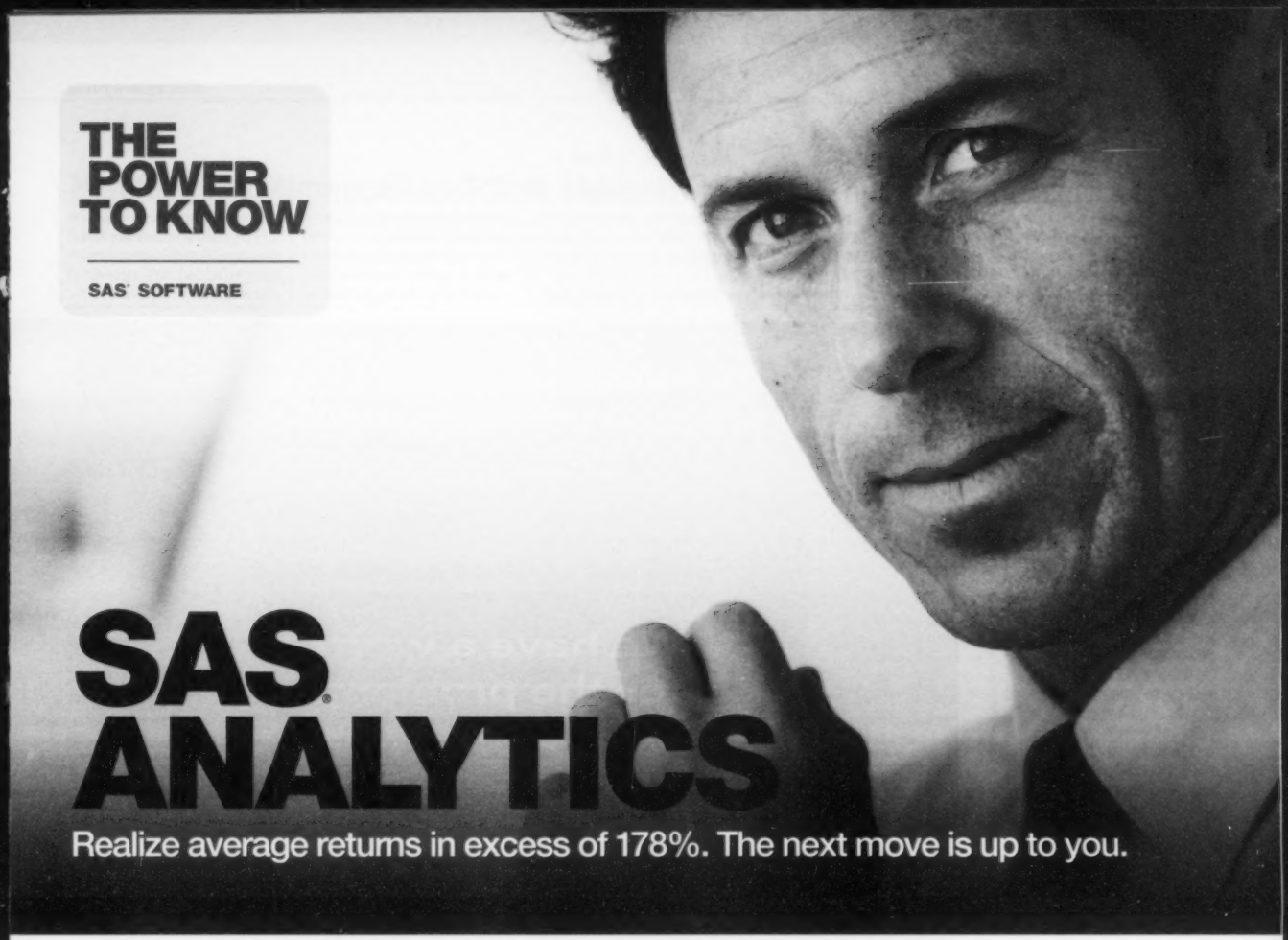
"I think the fishing is pretty good," said Millar, referring to his networking prospects at the conference — not the lakes and streams back home in North Carolina.

The conference drew several economic development officials looking to attract employers to their regions. They included Pierre Leclercq, director of business development for Belgium, and Bob Cook, president of the El Paso Regional Economic Development Corp. in Texas.

Millar said that North Carolina may be attractive as a location for data centers because of its power costs — 4.5 cents to 5 cents per kilowatt-hour, compared with 6 cents to 11 cents per kilowatt-hour in other areas of the country.

In addition, Millar noted that Catawba has a strong electric grid infrastructure, which was built to support furniture makers.

Relocating or building a data center far from corporate headquarters is a move only large companies are likely to undertake, according to AFCOM attendees. ▸



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Calif. Lawmakers to Vote on Five Bills to Regulate RFID Technology

BY MARC L. SONGINI

The California State Senate is expected to vote as early as this week on several bills that would regulate the use of radio frequency identification (RFID) technology in government documents.

Similar legislation was approved by the state legislature last year only to be vetoed by California Gov. Arnold Schwarzenegger in October. At the time, Schwarzenegger said he rejected the Identity Information Protection Act of 2006 because it could be overly restrictive to state agencies.

That bill's sponsor, state Sen. Joe Simitian, resubmitted five separate bills late last year and early this year that cover the same ground as the failed bill. The bills have been working their way through various legislative committees, he said.

Two of the bills would impose a three-year moratorium on the use of RFID technology in California driver's licenses and in public school ID cards, while a third would create interim privacy safeguards for existing RFID-enabled government IDs, such as those that students use in the state college system.

A fourth bill would make it a crime to "skim," or surreptitiously read, data from an RFID document.

The remaining bill addresses fears that companies might try to force their employees to undergo an RFID implantation, noted Simitian.

Simitian said he hopes the legislation has better success this time around. The earlier bill "got all the way to the governor's desk, and there was a last-minute setback there. But we're building on a foundation. What we achieved last year was a substantial accomplishment. That's a good place to start," he said.

A spokeswoman for Schwarzenegger last week said the governor has yet to take a position on the new RFID bills.

Even if Schwarzenegger were to sign the bills, California residents would still need more protection, said Katherine Albrecht, a consumer rights advocate. She suggested that state officials might be tempted to abuse RFID tracking technology.

"Government officials would love the ability to secretly identify political opponents, protesters at peace rallies or anyone else engaged in peaceable First Amendment-protected activities," she said.

Michael Shamos, a professor who specializes in security issues at Carnegie Mellon University in Pittsburgh, said that the legislation doesn't deal comprehensively with RFID privacy issues beyond the government sector. However, he added, "it's a good statute."

New Sun Exec Aims to Close Solaris 'Usability Gap'

BY ROBERT MULLINS

Ian Murdock *says he drew a lot of puzzled looks from colleagues in the Linux community when he joined Sun Microsystems Inc. last month as chief operating platforms officer. After all, Murdock is the "Ian" in Debian Linux, the distribution he created with his wife, Deb. In an interview with the IDG News Service, Murdock talked about his plans for his new role.*

Are some people surprised that a Linux guy would go to work for Sun? Sun's Linux strategy is not well articulated. People who ask why I'm at Sun say, "I thought Sun was anti-Linux." That's not true at all. Solaris is the operating system of choice, no doubt at all, but there is a certain part of the market that wants Linux. Why argue with that? We can do a better job of articulating the Solaris strategy.

How can Sun make Solaris look like or be as appealing as Linux? I refer to it as the usability gap. Solaris has some great technology, and I think Solaris has innovated more than Linux in the last few years. But at the same time, my first thought is [Solaris] seems like Linux 10 years ago [in terms of] installation, packaging and general usability. It comes down to how do you remove those barriers to adoption so that the truly unique and innovative features of Solaris are what people see.

Some of the desktop-oriented Linux distributions, like Ubuntu, for example,

have garnered a tremendous amount of developer mind share. But what people love about Ubuntu is not the Linux kernel, but all of the stuff that lives above it. So we [could] take all that stuff above Linux and put it above Solaris in a way that does not leave behind all of the differentiating features of Solaris.

How much interest does Sun have in connecting with the software development community? Very, very high. I think a lot of very good things stem from developer mind share. When I was at Purdue University as a computer science student in the early '90s, Sun technology was cool and it had the developer mind share. At some point, Linux captured that most-favored status. As a result, when people start a Web 2.0 company or any start-up, they don't want to spend their time building infrastructure; they want to get to the application development. So they reach for what they know, which is Linux, and they use Linux in production. As those companies get bigger, there is opportunity there. Gaining developer mind share [early] gets you in the door at start-ups. ▸

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GLOBAL DISPATCHES

An International IT News Digest

British UFO Hacker Loses Second Appeal

LONDON

A BRITISH HACKER who broke into U.S. military computers looking for evidence of UFOs lost an appeal of an extradition order last week in London's High Court.

Gary McKinnon, of London, remains free on bail and could appeal the decision to the House of Lords, according to a High Court spokesman.

McKinnon is accused of deleting data and accessing information on 97 U.S. military and NASA computers between February 2001 and March 2002. He was charged in a U.S. federal court in Virginia and could face up to 60 years in prison.

McKinnon challenged an initial U.S. extradition order in May 2006, but it was ultimately approved by U.K. Home Secretary John Reid. He then challenged Reid's decision and lost that appeal last week.

McKinnon contends that he could be held in the U.S. as an "enemy combatant," a status created for terrorism suspects.

McKinnon has admitted to hacking into the computers but says he never caused any harm. U.S. officials, however, say his probes caused $700,000 in damage and resulted in the shutdown of critical computers used by the military.

■ JEREMY KIRK, IDG NEWS SERVICE

GLOBAL FACT

$2.2B

Amount that small and midsize firms in the U.K. are projected to spend on data storage and data security products and services this year.

SOURCE: ACCESS MARKETS INTERNATIONAL PARTNERS INC., NEW YORK

Capgemini to Oversee Queensland IT Project

QUEENSLAND, AUSTRALIA

THE IPSWICH CITY COUNCIL here has begun work on a multiyear effort to transform its supply chain, customer service and workforce management operations.

The council has hired Paris-based Capgemini to provide consulting services for the project, which is expected to cost $15 million Australian ($12.2 million U.S.).

Capgemini officials said the initiative will include the eBusiness software suite from Oracle Corp. along with products from Kronos Inc., Exor Corp. and Obsidium Software.

Phase 1 of the project is expected to take about 12 months, Capgemini said.

The Ipswich City Council mayor, Councillor Paul Pisasale, noted that he expects the project will result in "significant cost savings" that "will help us put more services back into the community."

■ RODNEY GEDDA, COMPUTERWORLD AUSTRALIA

Lycos Service Ready For European Testing

HAARLEM, NETHERLANDS

LYCOS EUROPE NV later this month will roll out throughout Europe a beta version of a service that links several trendy functions.

The service, called Jubii, includes e-mail, instant messaging, Short Messaging Service and voice-over-IP (VoIP) services, along with photo-, video- and file-sharing capabilities, said Jan Wergin, executive vice president of the service. Lycos Europe hopes the convenience and simplicity of Jubii will appeal to users.

Jubii was launched in the U.S. in February. Lycos Europe, which is based in Haarlem, Netherlands, can't use the Lycos brand name in the U.S., so it named the service Jubii, a Danish word for joy or fun.

The beta version includes 10GB of storage and up to 30 minutes of VoIP calls per day.

The final release of Jubii will feature 4GB of storage, and Lycos Europe will sell more storage as part of a premium paid service, along with VoIP minutes, Wergin said. Pricing for the final version hasn't been determined, he said.

Jubii will be available in Germany, Denmark, France, Italy, the Netherlands, Spain and the U.K., Wergin said.

■ JEREMY KIRK, IDG NEWS SERVICE

BT Unveils Tools to Build Web 2.0 Features

LONDON

BT GROUP PLC is testing an online service that promises to help small and midsize businesses add Web 2.0 features such as blogs, podcasts and click-to-call capabilities to their Web sites.

The service, called BT Tradespace, is aimed at businesses whose staffers have little or no technical experience. The beta version is available without charge, according to the London-based company.

Malcolm Pankhurst, owner of Backchairs Direct Ltd., a retailer in Sevenoaks, England, has turned to Tradespace to beef up his company's Web site and make its ergonomic chair business more visible.

"It's generally easy for people to find me, but I think more and more people are attaching themselves to specific communities," Pankhurst said.

The service includes templates for building Web pages and tools for creating the Web 2.0 features.

BT did not disclose the cost of the service or when the final version will ship.

Mark Rowatt Anderson, a product development consultant in Edinburgh, said the service's tools are impressive. "It makes it really easy for people to set up blogs and social networks for businesses that aren't used to that," said Anderson, who tested the service.

■ JEREMY KIRK, IDG NEWS SERVICE

Ufida Software Ports ERP Apps to DB2

BEIJING

UFIDA SOFTWARE CO. last week announced that it has ported its ERP applications to IBM's DB2 database, hoping IBM can open doors to help it expand operations to more international markets.

IBM helped the Beijing-based software supplier migrate its products to the DB2 9 database and to WebSphere Application Server. Ufida's applications previously worked only with Microsoft Corp.'s SQL Server database and .Net middleware.

Ufida said that it wants to expand its business beyond mainland China and is setting up offices in Japan and Hong Kong. The company noted that nearly all of its current customers are in China.

The company added that it is already working with IBM to jointly sell a package of the two companies' products to an unnamed Tokyo-based company. IBM provided the initial sales connection and is helping Ufida localize and port its software for Japan, Ufida said.

Over the longer term, Ufida said, it will look to IBM to help it gain customers in Singapore and other parts of Asia.

■ SUMNER LEMON, IDG NEWS SERVICE

Compiled by Mike Bucken.

Briefly Noted

Texas Instruments Inc. and the Indian Institute of Science in Bangalore, India, have agreed to conduct joint projects in areas such as digital signal processing (DSP), analog circuits and mobile wireless applications. TI will spend $400,000 over five years to fund research projects at the IIS. TI signed the pact to gain access to the institute's expertise in DSP and analog circuits, said Richard Templeton, TI's president and CEO.

■ JOHN RIBEIRO, IDG NEWS SERVICE

The European Commission's directorate general for IT has signed a contract with BT Group for Internet access services. The four-year deal, with options for a four-year extension, could be worth up to €22.5 million ($30 million U.S.). The contract calls for London-based BT to supply, implement and manage Internet access services across Europe.

■ TASH SHIFRIN, COMPUTERWORLD U.K.

BHP Billiton Ltd. has extended Computer Sciences Corp.'s application services agreement by two years. The extension is valued at $100 million Australian ($80.6 million U.S.). CSC will provide software development and maintenance support to the Melbourne-based mining company through May 2009. CSC has provided similar services to BHP since 2000 under a seven-year, $700 million Australian ($570 million U.S.) pact.

■ SANDRA ROSSI, COMPUTERWORLD AUSTRALIA

Police have recovered a stolen U.K. National Health Service laptop containing the names, addresses and dates of birth of 11,500 children. The machine was one of three stolen from Nottinghamshire Teaching Primary Care Trust on March 21. An agency official said technicians are examining the laptop to determine whether the thieves accessed the data.

■ TASH SHIFRIN, COMPUTERWORLD U.K.

The U.K. Department of Health has extended an outsourcing contract with CSC for two years, in a £20 million ($39 million U.S.) deal. CSC has provided the agency with infrastructure and application support services for its 4,500 employees since 2002. The new deal extends the contract to 2011.

■ TASH SHIFRIN, COMPUTERWORLD U.K.

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DON TENNANT

IT's Finest Hour

LAST WEEK, we posted a story on our Web site titled "Don't Believe the Hype: The 21 Biggest Technology Flops." It was one of those articles that elicited pages and pages of reader comments. Most were insightful; many were amusing; a handful were disturbing.

DON TENNANT is editor in chief of Computerworld. Contact him at don_tennant@computerworld.com.

Among those in the "disturbing" category was the very first comment. "What about the Y2k bug? [Weren't] there supposed to be banks losing all the money they had in their vaults, [airplanes] dropping from the sky and general global unrest as the clock ticked over to midnight?" the reader asked. "Must be THE most overhyped event of the 21st century, as none of it happened."

"Absolutely!" another reader agreed. "Y2k has to be THE single biggest overhyped nonevent in the technological era!"

"As soon as I started reading the article, I thought of Y2k," a third reader chimed in. "It was really overhyped by the media."

Really? That's not the way I remember it.

I spent the evening of Dec. 31, 1999, in the data center of Hong Kong's largest air cargo handler, Hong Kong Air Cargo Terminals Ltd., better known as HACTL. Granting a journalist unrestricted access to the data center that night was a phenomenal risk, especially when you consider that just a year earlier, systems failures associated with the relocation of HACTL to Hong Kong's new airport created cargo-handling chaos that caused widespread damage to the local economy.

There's no question that tensions had to be high in that data center as the clock ticked closer to midnight. Yet you never would have known it. Thirty programmers and systems administrators were calmly monitoring HACTL's two critical systems: the cargo inventory system and the warehouse activity management system, both of which operated on IBM RS/6000s running Software AG's Adabas database.

To this day, I remember the moment that Marcus Mok, HACTL's general manager of information services, managed to smile. It was about 1 a.m. on Jan. 1, 2000, and both the systems were performing flawlessly. His sense of relief had to be almost overwhelming. Mok no doubt had the utmost confidence in his crew and the preparedness of his systems. The fact is, though, that none of us really knew what was going to happen. In the end, at HACTL, like virtually everywhere else, Y2k had indeed proved to be a nonevent.

But to attribute that outcome to media hype is to engage in a destructive, disparaging revisionism that mindlessly casts aside the foresight and dedication of an IT community that worked tirelessly for years to fix the problem.

Thankfully, other readers of that "Don't Believe the Hype" article remember what really happened.

"Y2k was a nonevent because thousands of IT professionals worked many thousands of hours, often late into the night, to [ensure] that it was a nonevent," one reader explained. Another agreed, noting that had Y2k gone ignored as long as the daylight-saving time issue did, "we'd still be in a world of pain."

But it was this reader who really nailed it: "I was one of those people who spent literally months plowing through thousands of lines of mainframe Cobol," he wrote. "Were it not for people like me all over the world who fixed the problems in the legacy code, Y2k would have been the financial disaster of the century."

He's right. And he was right when he entered this into the subject line of his posting: "Y2k was IT's finest hour." To forget that is to forget what a galvanized IT community is capable of accomplishing. And we simply can't allow that to happen.

Don Tennant

MICHAEL GARTENBERG

Google Apps No Threat to Office — Yet

ONE OF THE big announcements of the past few weeks was Google Apps Premier Edition. Some analysts say Microsoft should be worried. Can Microsoft and other competitors ignore Google's offering? No, but I don't think they need to worry at the moment.

Reports of Microsoft Office's imminent demise naturally make me think of Mark Twain, who memorably said that reports of his death were "greatly exaggerated."

Don't get me wrong. There's a lot to like about many of Google's offerings. Gmail is very good, for example. Others, such as Google Talk, aren't bad, but they're hardly best of breed. As for the new productivity applications, they lack far too many features for most people to use them on a regular basis.

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Other online offerings, such as Zoho and wikiCalc (the latter created by Dan Bricklin, who did that other spreadsheet, called VisiCalc, way back when), offer more features and are at the moment more compelling. Standalone products such as StarOffice and Corel WordPerfect Office offer far more features than any online tool and are good choices for folks who want alternatives to Microsoft Office.

Some of you are no doubt thinking that no one needs all the features in programs such as Office. Perhaps. I suspect I use only 20% of the features in Office about 80% of the time. Maybe you do as well, but here's the thing: My 20% are probably different from your 20%. And my needs vary depending on what I'm doing. When I write research reports or blog posts, I rarely care about word count, for

example. When I write this column, it's a critically important feature. Google Apps just won't cut it for most business users, even casual ones.

Technology similar to Google Apps has been around for years without making any significant impact. In the '90s, IBM rebuilt Lotus SmartSuite as a set of limited-function Java applications. I have a copy, still shrink-wrapped. And the truth is that if any company other than Google had brought this stuff to market, we wouldn't even be talking about it.

No online productivity suite is going to overcome the drawback that your information and documents can't be accessed when you're not connected. I travel a lot, and I wouldn't get much done if I couldn't have access to all my documents when I'm on a plane. Yes, connectivity is becoming more ubiquitous, but it's still not possible to be online at all times. As for caching, that's an imperfect solution, and I don't want to think about the nightmare of syncing between online and offline stuff.

So don't write Microsoft Office's obituary just yet. *The New York Times* reported that Nielsen/NetRatings had pegged Google's Docs and Spreadsheets at 432,000 users in December. The *Times* also quoted Microsoft as saying that Office has 450 million to 500 million users. Even if those numbers aren't totally accurate, I don't see the need for Microsoft to close up the office and go home just yet. And alternatives such as Zoho and Corel aren't in any immediate danger either.

Still, it should be mentioned that in 1910, Mark Twain did indeed die. Reports of his death were no longer exaggerated. Like all good things, Office is likely to be replaced by something else someday. But this isn't the day, and Google Apps isn't the product. ▸

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www.computerworld.com/columns

Online Chatter

Raw excerpts from readers' comments on stories at Computerworld.com

RESPONSES TO:
Living (and Dying) With Linux in the Workplace
MARCH 21, 2007

Switching to Linux is like learning a new language

As a former Windows power user who tinkered with Linux for years, I understand where you are coming from. A lot of Windows power users are initially frustrated by Linux, because a lot of their tricks and tweaks don't work the exact same way. You can't expect to take the 15+ years you've spent with Windows and have a seamless transition to an entirely new OS. Heavens, someone using only Windows 3.1 would have a difficult time switching to Vista!

I like to compare the transition to learning a new language. You may be a good journalist in English, but if we were to move you to, say, Chile, your journalistic skills – while still intact – would certainly suffer a productivity loss while you grappled with the new language and culture.

I appreciate the fact you did point out that there likely ARE alternatives to the features you are missing. I assure you that there most certainly are. And that's one of the most refreshing things about Linux – there's not just one choice, there are several. And the Linux community on the web is tremendously helpful.

I didn't really understand the power of Linux until I finally made the decision to do away with Windows. It wasn't easy, and there certainly were some hard times, but keeping with the commitment has paid off big – I'm far more productive on my Linux box than I ever was on Windows. There's just so much more you can do . . . don't give up! It's more than worth it. And it's a lot of fun!
SUBMITTED BY: *David*

It's nice to see an even-handed review of the abilities of Linux in a business setting. There's lots of useful info here without the religious fervor that usually accompanies an article on Linux.
SUBMITTED BY: *BrianP*

RESPONSES TO:
Time Isn't Always On Our Side in IT
APRIL 2, 2007

NTP knows nothing about DST

This article states: "Nowadays, most modern operating systems have an internal mechanism for ensuring that the time is correct, including an automatic switch to DST. This system is called Network Time Protocol, or NTP."

Not true: NTP keeps time in UTC (Coordinated Universal Time), formerly known as GMT (Greenwich mean time) and is unaware of any DST time changes or time zones. NTP is NOT the mechanism which will change the system time for Daylight or Standard time in a particular time zone. This is taken care of by the operating system reading internal tables, which apply an offset relative to UTC according to a local time zone variable.

That table is the mechanism that will take care of displaying the correct time for a particular time zone, not NTP.
SUBMITTED BY: *Unixman*

RESPONSES TO:
House Bill Seeks to More Than Double H-1B Visa Cap
MARCH 22, 2007

The McCain-Kennedy illegal immigration amnesty and H-1B expansion legislation will keep the wages of the Middle Class stagnant at the same time we have to pay for the healthcare, education, and law enforcement costs associated with illegal immigration. It will also keep the wages of the Poor and Working Class in the US stagnant. Please contact your Congressional representative and tell them to end the H-1B and L-1 Visa programs, repeal the 1965 immigration act, and oppose the McCain-Kennedy illegal immigrant amnesty legislation.
SUBMITTED BY: *Tom*

RESPONSES TO:
8 Million Reasons
MARCH 26, 2007

Wal-Mart Lost Nothing

As a banking industry executive, I can assure you that Wal-Mart lost nothing in this scam. Once the card issuer (bank) authorized the transaction, Wal-Mart is entitled to the money. Many banks chose not to reissue cards after the TJX incident, taking the gamble that the fraud they would experience would cost less than the cost to reissue cards.

I'd like to point out another flaw in this story. Wal-Mart could not block the affected credit card numbers after they were known because Wal-Mart would not be allowed to have those numbers. The only ones that knew which numbers were compromised were TJX and the banks that issued the cards.

VISA, Mastercard, AMEX and Discover need to impose more severe consequences for merchants that violate the security rules in place for handling customer card information. This has been slow to happen because VISA and the rest still get their transaction fees from the fraudulent transactions and they don't want to make it too hard for merchants to be able to accept cards carrying their logo. The banks have to eat all the losses associated with these types of compromises, although more recently they have tried to band together and sue merchants guilty of breaking the rules.
SUBMITTED BY: *Anonymous*

RESPONSES TO:
FAQ: Here's The Scoop on the Windows Animated Cursor Bug
APRIL 2, 2007

What has MS been doing since December, 2006?

If MS was apprised of this problem in December, 2006, why is this a "zero-day exploit"? Why weren't they at work on a patch that they silently slip in with other security patches and no one would know the difference? Now it's a fire-drill – incompetence runs deep at Microsoft.
SUBMITTED BY: *Anonymous*

Anybody else find it amusing that a Microsoft spokesperson recommends against using the third-party patches because they have not received Microsoft's ". . . thorough testing and evaluation for quality"?

Thorough testing? Quality? Somebody needs to remind those arrogant fools who is responsible for the bug in the first place.
SUBMITTED BY: *Anonymous*

RESPONSES TO:
Why Microsoft Should Fear Apple
MARCH 28, 2007

If Mac has to make itself use Windows hardware, run Windows OS and software like Windows, to try to grow its market share, [Apple] will forever be playing catch up to MS.
SUBMITTED BY: *BCADY*

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KNOWLEDGE CENTER STORAGE

Inside 04.09.07

Power Drain. The scramble is on to store more kilobytes using fewer kilowatts. PAGE 30

Lean & Mean. Three companies reduce space and power demands — and cut storage costs. PAGE 36

Opinion: Will CIOs emerge more powerful from the storage crisis? Mark Hall doesn't think so. PAGE 46

The Lean Storage Machine

SPECIAL REPORT

Technologies for saving space, money and energy.

EDITOR'S NOTE

Data stores are getting fat. In fact, the amount of stored data worldwide is heading toward a corpulent zettabyte in the next 10 years, with no end in sight. A storage crisis looms, experts say. IT managers in a recent *Computerworld* survey estimated that their companies' storage capacity will jump a hefty 43% on average in the next 12 months.

Data might be piling up, but when it comes to storage systems, slim is in.

Burgeoning storage demands, coupled with the rising cost of power, are forcing companies to be ruthless about keeping their storage systems lean. Some are rejiggering their overall storage structures, and others are employing new technologies. In both cases, the goal is to consolidate hardware, reduce space and power demands, and lower costs.

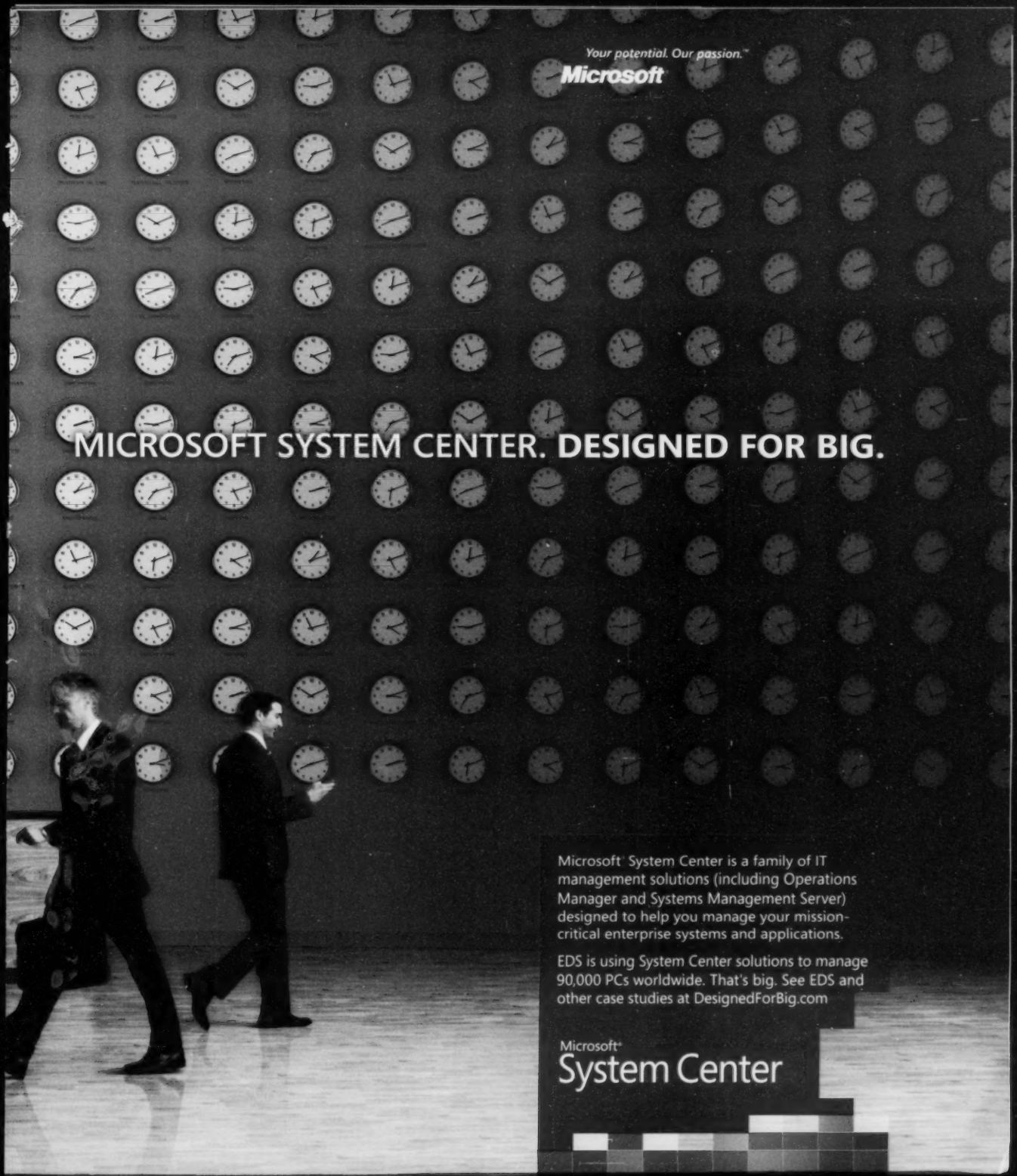
At Intellidyn, for example, a modular storage system designed to reduce rack space has saved the company $170,000 in power and support costs. Conxerge cut costs with a SAN shared-disk system that uses less power and fewer disks and servers. The company's power consumption has dropped as much as 70% – for an annual savings of $2,100 per rack. At Fotolog, storage servers can expand volumes as needed, saving $60,000 in administrative costs each year.

Lean storage is catching on. Among the respondents to our survey, 62% said they are taking steps to reduce costs related to their companies' overall storage hardware footprints. And 53% said power and cooling requirements are a moderate to major consideration when buying data storage equipment.

So, what does this mean for IT? Columnist Mark Hall argues that despite what some in the industry say, the impending storage crisis won't elevate the status of IT executives. What IT must do, he says, is make sure workers have as much information as they need.

Whether IT reputations will be polished or tarnished is yet to be determined. But following the examples of companies like Intellidyn, Conxerge and Fotolog and saving thousands in storage costs is a sure way to come out of the capacity crunch looking like a star.

Ellen Fanning is special reports editor at Computerworld. *She can be contacted at ellen_fanning@computerworld.com.*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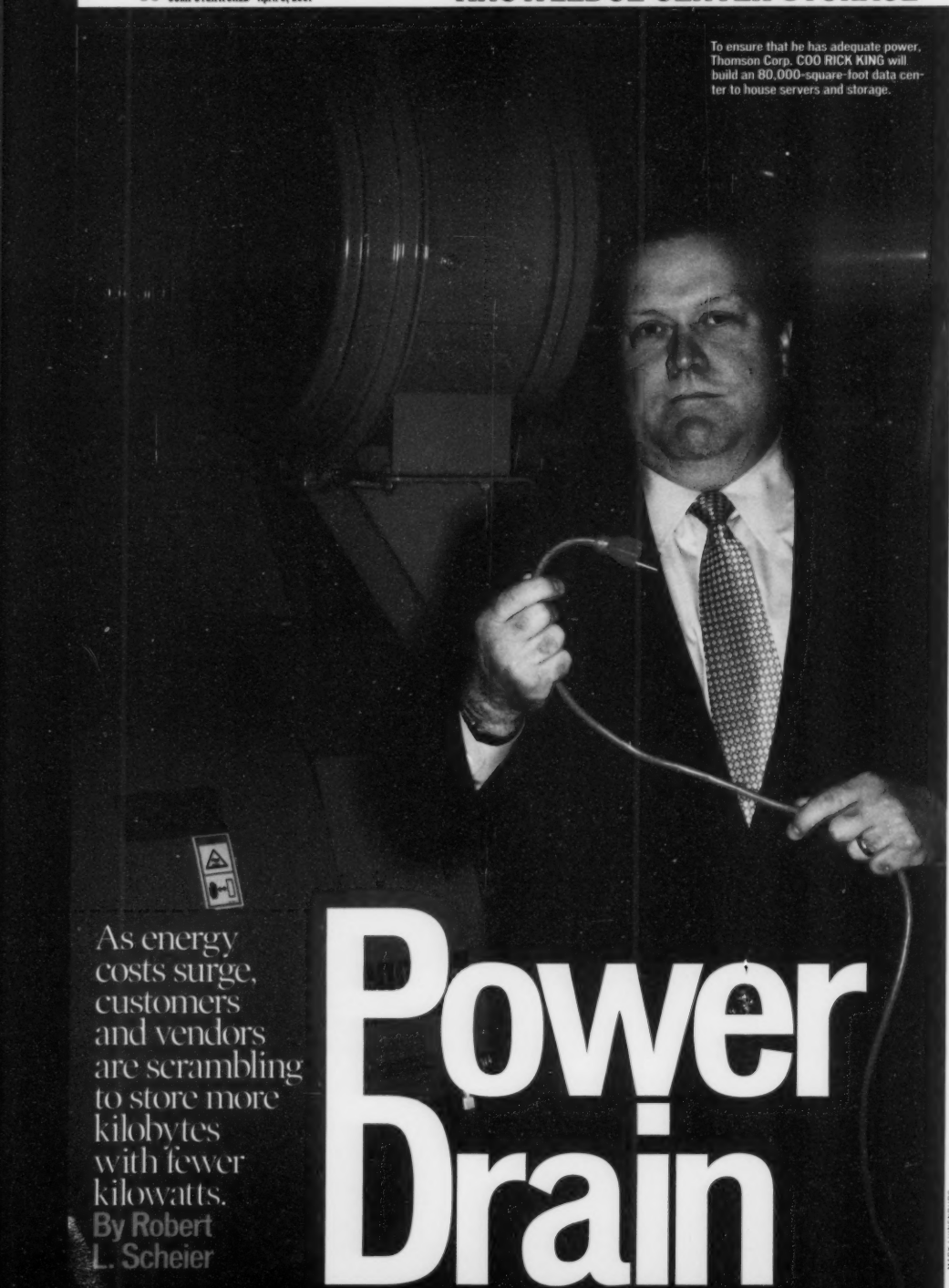


To ensure that he has adequate power, Thomson Corp. COO RICK KING will build an 80,000-square-foot data center to house servers and storage.

MARK LUHENBURG

Power Drain

As energy costs surge, customers and vendors are scrambling to store more kilobytes with fewer kilowatts.

By Robert L. Scheier

RICK KING helps run a $3.1 billion information services business for The Thomson Corp., and he says it's crucial to get enough power to store the 2.5 petabytes of legal and regulatory data the company provides to its customers.

King, executive vice president and chief operations officer for Thomson's North American Legal business, completed a 17,000-square-foot upgrade of two 10-year-old data centers in May 2005. Among other things, he boosted the power available from the original 25 watts per square foot to the 60 watts required by today's denser, virtualized servers and storage. He also added redundant power feeds from separate electric substations and added more backup batteries and generators.

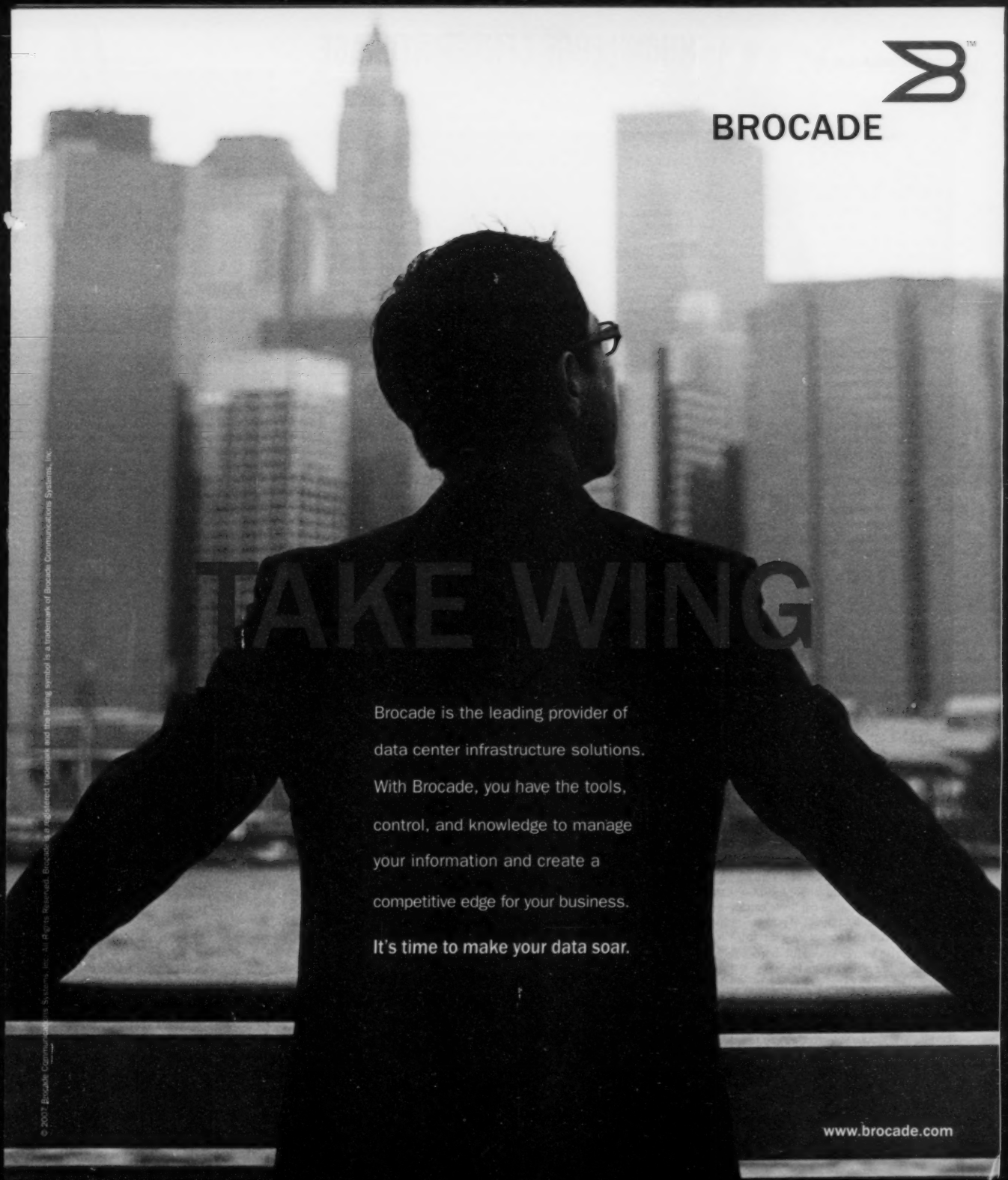
With the online share of Thomson's business growing rapidly, King can't afford to rely on third-party data centers that might not have access to sufficient power — or the will to make costly upgrades. So he's preparing to consolidate smaller data centers and build a new 80,000-square-foot data center (with at least the same 60-watt-per-square-foot capacity) to house servers and storage for his company's growing customer base.

Thomson's hardware footprint is no small investment. And with power costs on the rise, King says his main concern now is finding and keeping skilled staffers who understand the interplay of computing technology, power requirements and facilities design.

Those skilled staffers come at premium prices, stretching budgets even further. In the second half of 2006, pay for some storage administrators grew 20%, according to David Foote, CEO and chief research officer at IT workforce consultancy Foote Partners LLC in New Canaan, Conn. Salaries for senior storage network administrators had risen 10% in the 18 months prior to December 2006, which was "well beyond the average growth in pay for IT jobs overall," Foote says.

The combination of scarce and more expensive power, rising administrator salaries and storage needs that are growing as much as 70% annually is hitting IT budgets hard. Here's how some companies are coping with these multiple storage headaches.

Continued on page 32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8 Ways to Reduce Data Center Storage Costs

Almost every storage vendor claims that its technology cuts power and cooling needs. Most pitches have at least a grain of truth, since anything that reduces data volume also reduces energy costs. Here are eight ways to start saving.

Information life-cycle management (ILM) is as much a management philosophy as a technology and involves moving data to less-expensive systems or eliminating it as its value falls. Many vendors provide software and services to help customers implement ILM. For example, EMC Corp. recently introduced a program called Energy Efficiency Services through which it helps customers estimate energy consumption of specific EMC product configurations under various workloads.

Another common data center strategy – **virtualization** – makes more efficient use of both servers and storage by combining physical devices into logical "pools" that can be more completely utilized than separate, stand-alone devices. This can cut power demands by reducing the physical servers and storage an organization requires. But it can also increase power demands by using very dense racks of servers and storage that max out the power capacity of data centers long before they are physically full.

De-duplication and compression can yield a 20-to-1 reduction in storage needs by storing only the differences between old and new copies, or by reading data as it is written to the backup device and storing only the unique data. Among the vendors offering such products are Data Domain Inc., ExaGrid Systems Inc., Asigra Inc. and Avamar Technologies Inc., now owned by EMC.

By allocating as much "logical" capacity on drives as applications are expected to require but allocating physical capacity as the applications actually need it, storage servers from vendors such as 3PARdata postpone the need for additional drives. This approach, also known as **thin provisioning**, gives storage managers more time to juggle capacity and buy drives.

More possible power savings come from **MAID (massive array of idle disks) storage** from vendors such as Copan Systems Inc. This technology spins up a drive only when data is required from it. But the extra time required to spin up the drive can make MAID unfeasible for applications such as transaction processing, which require high performance.

Still other vendors tackle overall storage management costs, and therefore power issues, with combinations of **specially designed hardware and software.** BlueArc Corp., for example, claims its Titan 2200 file server, which can serve as a front end for multiple storage-area network or network-attached storage systems, generates one-third the heat and provides twice the performance of competing high-end NAS hardware. Agami Systems Inc. uses 64-bit Opteron chips to create high-end NAS servers that consume half the power and as little as one-eighth the space of other NAS hardware, says Paul Speciale, vice president of product management.

Some vendors have built **temperature sensors** into storage arrays and other hardware to direct cooling to where it's needed most. For example, Hewlett-Packard Co. claims that its Dynamic Smart Cooling System can save 25% to 40% of a data center's energy use.

Finally, and furthest in the future, is the prospect of replacing power supplies that convert AC power into DC power for individual servers and storage devices with **centralized DC-based power distribution systems.** Backers say such centralized systems are more efficient than many of the individual power supplies that ship with typical servers and storage, and some small server vendors have shifted to DC power.

– ROBERT L. SCHEIER

Continued from page 30

WHERE'S THE JUICE?

Disk and tape drives typically consume only one-fifth or less of the electricity used by a data center, with servers using much of the rest. But every terabyte of data stored online and available for production applications needs to be backed up for disaster recovery, with a third copy often archived for legal purposes. Saving data in triplicate can, of course, triple the amount of power required to run and cool storage devices. It can also lead to a need for more ducts or water pipes and an increase in the emergency battery or generator capacity needed.

Electricity is also getting more expensive. Commercial customers such as data centers paid an average of 7.43 cents per kilowatt-hour in 2000 and an average of 8.67 cents per kilowatt-hour in 2005, according to the U.S. Department of Energy. By November 2006, the average price had risen to 9.11 cents per kilowatt-hour, the department says. And regional spikes to as high as 14.38 cents per kilowatt-hour in some locales led customers such as Microsoft Corp., Yahoo Inc. and Intuit Inc. to build large data centers near power sources in eastern Washington, says Jim Kerrigan, a principal at The Staubach Co., a commercial real estate firm in Chicago.

"The power situation has gotten to the critical stage over the past year and a half," says George Coulter, vice president and CIO at The AES Corp., a global utility and power-generation company in Arlington, Va. "Our data centers are pretty much at capacity," he says, adding that obtaining power for cooling is a bigger challenge than obtaining electricity to run the equipment in the first place.

In late 2006, market research firm Gartner Inc. estimated that by 2008 nearly 50% of data centers worldwide will lack the power and cooling capacity needed to support high-density equipment such as blade servers.

Increases in the demand for power are outpacing expansions of the nation's power transmission grid, the large power lines that send electricity from power plants to major urban areas, says Clark Gellings, vice president of innovation at Electric Power Research Institute Inc. in Palo Alto, Calif. In an August 2006 report, the Department of Energy said that the Northeast and the Los Angeles area were particularly prone to congestion in these lines.

While the cost of building data centers varies widely according to their location and the degree of uptime they need to provide, Kerrigan says a data center providing "five 9s" (99.999%) reliability can cost upwards of $1,000 per square foot.

COPING STRATEGIES

To combat high costs and low availability, some users are being forced into collocation facilities that rent space to multiple companies. Universal Service

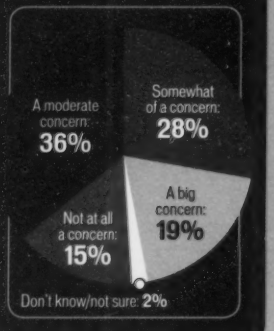
Continued on page 34

On the Rise

By what percentage do you expect your company's storage capacity to increase in the next 12 months?

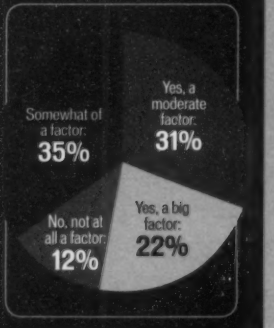
Cool Storage

Increasing power requirements and heat dissipation issues have become a concern for servers in the data center. How much of a concern are power and cooling requirements in choosing your data storage infrastructure?



Energy Wise

Are power and cooling requirements (energy efficiency) a factor when you're buying data storage equipment?



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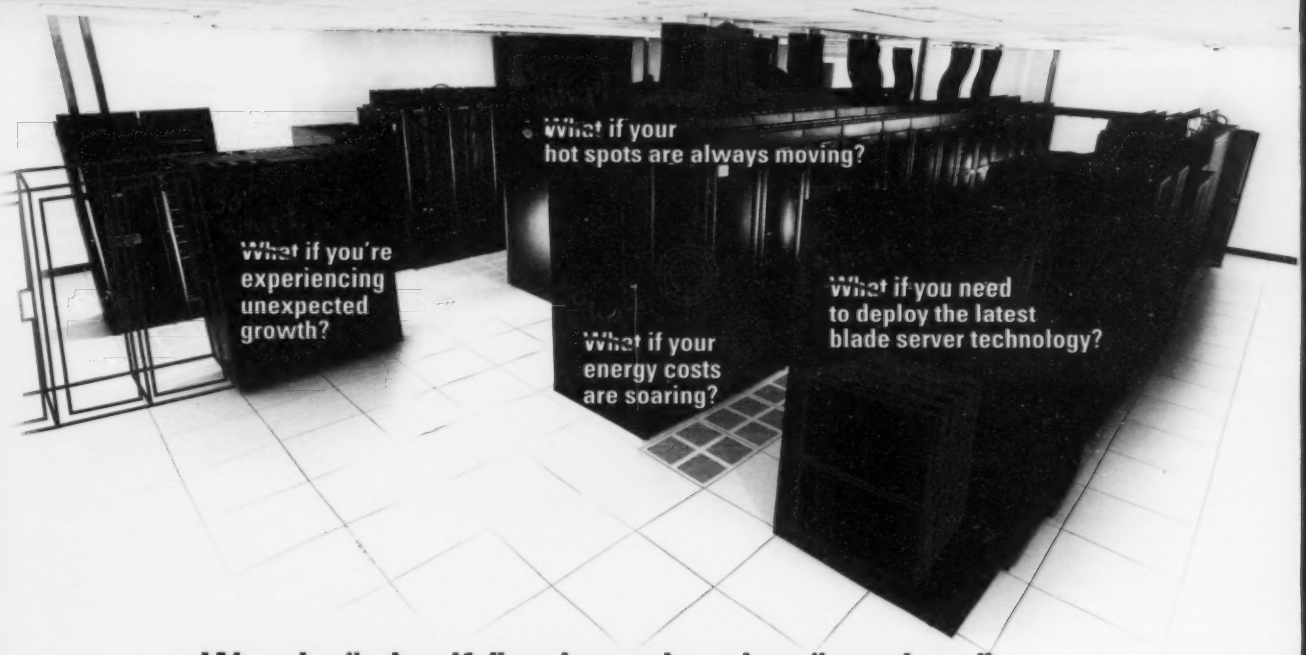

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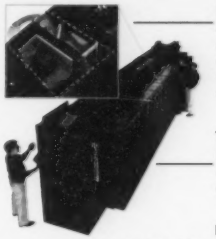

Close-coupled cooling method

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Tape Tales

A TAPE CARTRIDGE full of archived data sitting on a shelf doesn't need electricity. That makes tape an attractive way to hold down the electricity costs of storing infrequently used data, right?

Whether tape or disk is the most power-efficient technology "isn't a black-and-white argument," says Dianne McAdam, a consultant at The Clipper Group Inc. in Wellesley, Mass. "It's a question of what you're willing to pay for access time." If, for example, a financial institution faces a regulatory requirement to produce certain documents about a broker's activities within 48 hours of being asked, she says, "maybe that's the kind of information that has to be on disk," where it can be accessed quickly.

Enterprise Strategy Group Inc. analyst Heidi Biggar says users must weigh the costs of not having access to data stored on tape against the higher energy costs of keeping it on disk media. "Our research shows that users' tolerance for downtime is decreasing," while the cost of downtime in lost revenue and productivity is increasing, she says.

"Unless there is a significant spike in energy costs, I believe end users will continue to depend on, and increase their use of, disk for both primary and secondary storage applications, including backup and archive," says Biggar.

Fred Pinkett, vice president of market development at ExaGrid Systems, agrees, saying tape doesn't provide a significant power advantage over disk, and even if it did, the unreliability of tape, the time required to do backups and the manual work required to move tapes off-site are driving users toward today's ever-smaller, more-densely-packed disk-based backup.

Others are sticking with a combination. "Tape is attractive for reasons other than power," says Fotolog CTO Warren Habib, citing its low cost and the ease of archiving tapes off-site.

– ROBERT L. SCHEIER

Continued from page 32

Administrative Co. is moving much of its operations out of its Washington headquarters into such a facility. "We can't get any more draw to the building itself," says Bryan Sastokas, director of information systems, strategy and architecture at the organization, which administers a fund that pays for telecommunications services to rural and poor customers.

Hoping not to get caught short of power again, designers of new data centers are building in extra power and cooling capacity that can easily be tapped as needed. When outsourcing vendor Infocrossing Inc. built a new data center in Tempe, Ariz., it left 36 inches (rather than the usual 11, 18 or 24 inches) under the raised floors so it would have more cool air available in the future, says Chief Technology Officer Dave Leonard. It also designed

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for the products
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hard at work on.

extra capacity into both the power lines coming into the building and the connections that carry cooling water and air through the data center.

Other organizations are using technologies like virtualization, data de-duplication and data compression to reduce the amount of storage they need — and thus the number of power-hungry devices required to hold data. Vendor coalitions are also collaborating on ways to improve the energy efficiency of their products.

MANAGING LEAN

The process of managing storage can be one of the big contributors to its overall cost. But done right, storage administration can dramatically reduce the demand for storage.

Sastokas says he is relying on strict storage management policies, the use of document management systems "and changing workflows and culture" to eliminate common, space-wasting practices. For example, to avoid situations where users send multiple copies of a 5MB PDF to 30 or 40 co-workers, each of whom might store several revisions on a network drive, a document management system can direct all users to a single copy of the file.

Warren Habib, CTO at Fotolog Inc., a New York-based photo-sharing and social networking site, estimates that storage servers from 3PARdata Inc. save his company $60,000 in administrative costs annually, not to mention the savings in storage management software. Because 3PARdata's "thin provisioning" technology automatically expands storage volumes as needed, "we don't need to have people constantly resizing volumes or constantly monitoring our growth," says Habib.

Ken Lehman, group director for the shared services operation at defense contractor Northrup Grumman Corp. in Dallas, is focused on a companywide information life-cycle management project designed to hold back the growth of the more than 700 petabytes of data he already manages. Over the next three to five years, Lehman says, he doesn't foresee major technology changes "that are going to handle the demand coming our way." But properly moving data to less-expensive tiers as its value declines — and disposing of it when it's not needed — "has a direct impact on staffing, power, space, data protection" and every other piece of the storage cost footprint, he says.

In other words, it's fine to use new technologies such as de-duplication, thin provisioning and virtualization to reduce the amount of staff and electricity it takes to store your data. But put policies in place that let you classify and eliminate data wherever possible so you don't have to store it in the first place.

Scheier is a freelance writer in Boylston, Mass. Contact him at rscheier@charter.net.

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& Lean Mean

These three companies made major changes to their storage systems. Here's what they gained. **By Stacy Collett**

NO MATTER how vital stored data might be to the business, storage administrators still have to abide by the mantra "Do more with less." So with growing amounts of data and rising costs for power, companies are turning to new technologies that help consolidate hardware, reduce space and power demands, and lower costs. Here's how a few storage champions are using the latest technologies to get lean and mean.

MONEY-SAVER

ATLANTIC HEALTH
Morristown, N.J.
www.atlantichealth.org

- **Project lead: Pat Zinno, director of infrastructure services and support**
- **Approach: Standardized its storage equipment, streamlined its storage-area network, eliminated direct-attached storage and deployed a tiered-storage strategy.**

>>> Atlantic Health, a nonprofit health care system in New Jersey, took a hard look at its storage systems last year when faced with the cost and space challenges of adding a replicated hot site about 20 miles away from its Morristown headquarters.

When Pat Zinno, director of infrastructure services and support, assessed how the organization's mix of SAN and captive storage systems were being used, the results surprised him.

While the SAN storage operated efficiently, at 98% utilization, less than half of the 30TB available on locally attached storage was being used. "A handful of servers were always getting hammered with data. They were running out of disk space, and right next to it, there's a server with 200GB of free space, but I can't use it because it's captive in another box," Zinno recalls.

"We shrunk the database size of Exchange data stored down to what's locally on the server, so our Exchange system is performing better.

PAT ZINNO, DIRECTOR OF INFRASTRUCTURE SERVICES AND SUPPORT, ATLANTIC HEALTH

The financial picture wasn't pretty, either. Though the cost of local disk space was cheap, at about 5 cents per megabyte, Zinno still ended up spending $1.5 million to get 11TB of usable space. With the more efficient SAN storage, even at double the cost of local, "it was actually $402,000 cheaper than our locally attached storage when you look at the cost per usage," Zinno explains.

Atlantic Health took drastic measures to overhaul its entire storage system. First, Zinno created a dedicated storage team to oversee all current and future storage needs. Next, the health care system standardized on EMC devices, streamlined its SAN, eliminated direct-attached storage and deployed tiered storage — most of which is consolidated within a single cabinet.

In this tiered-storage structure, data is classified as mission-critical, business-critical or business-important and stored on an EMC Symmetrix DMX-3 system. This forms the basis for Atlantic Health's recovery time objectives and recovery point objectives during a disaster. The mission-critical systems, such as patient registration, medical charts, emergency room systems and Microsoft Exchange, are all directly attached to the DMX via Fibre Channel. Business-critical data, such as financial management, payroll and intranet data, are called up via iSCSI using a network-attached storage gateway. Storage classified as business-important also uses iSCSI and is backed up to disk using EMC NetWorker software.

Making choices about what data goes where based on its value has allowed the health care facility to reduce its storage acquisition costs.

Zinno also chose an EMC Centera archiving platform and an e-mail archiving component to connect with the DMX system. "From a performance standpoint, we shrunk the database size of Exchange data stored down to what's locally on the server, so our Exchange system is performing better," he says. And the majority of the mail that people never accessed now sits out on a much cheaper Centera disk. Zinno is also working with business units to determine what other noncritical data can be moved to the Centera for long-term storage.

RESULTS Although Zinno hasn't had a full year to measure results, the new storage system has shown some immediate benefits. "We have gained the ability to start doing disk-to-disk backups instead of using tapes. Our early estimates are showing a 35% reduction in the time it takes to complete a backup," he says.

While Zinno says he expects to achieve the cost and space savings he had forecast, he sees even more cost benefits down the road.

With storage consolidated into a single cabinet, Zinno says he can allocate the storage needed for a specific application and business unit and then accu-

Continued on page 38

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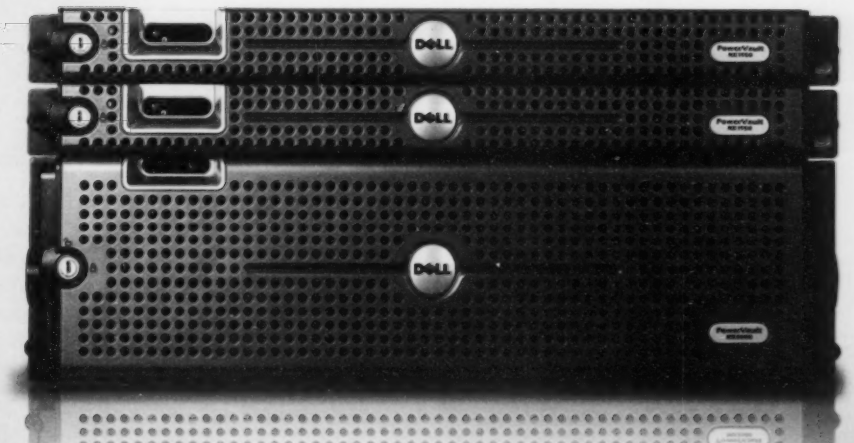

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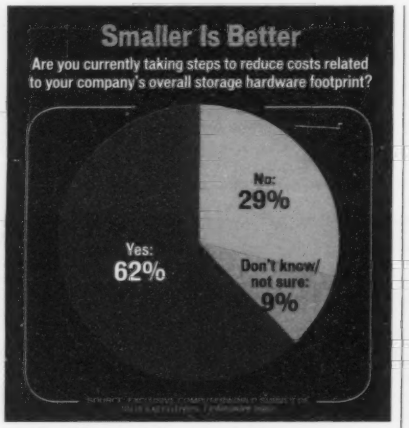

Smaller Is Better
Are you currently taking steps to reduce costs related to your company's overall storage hardware footprint?
No: 29%
Yes: 62%
Don't know/ not sure: 9%

Continued from page 36

rately charge back the cost to the business unit. "It gives us a better way to paint the picture of where money is spent in the business rather than one big IT storage purchase," Zinno says.

SPACE-SAVER

INTELLIDYN INC.
Hingham, Mass.
www.intellidyn.com
- **Project lead: Rajeev Kumar Gagneja, technical director**
- **Approach: Implemented modular storage with 4Gbit/sec. Fibre Channel port connectivity in a three-tiered storage model.**

››› Intellidyn Inc., a marketing database company in Hingham, Mass., relies on millions of intricate information records to deliver customized consumer data to its clients. Last year, technical director Rajeev Kumar Gagneja realized that the agency's three master databases and vast client data warehouses were outgrowing the company's storage system.

"Our storage requirement has gone from 500GB to almost 40TB of data in less than five years. Two years from now, I can fairly estimate that it will be a petabyte" of data, Gagneja says. Additional servers would require additional hardware, more contract maintenance workers and more physical space at the agency's Secaucus, N.J., data center.

> **"I'm doing the same thing in one rack versus what I would've done with three racks. Rack space savings over a three-year period is almost $60,000 per rack.**
>
> **RAJEEV KUMAR GAGNEJA,** TECHNICAL DIRECTOR, INTELLIDYN INC.

"The real estate in the data center is extremely expensive. So we really needed to manage the rack space," plus power and cooling costs, he adds.

Highly available clustered SANs had been implemented to address scalability (2TB to 30TB). But current configurations wouldn't allow hard disk drives to be mixed within the same storage frame, which prevented Gagneja from moving data as needed.

To save physical space, consolidate stored data and streamline its storage infrastructure, Intellidyn implemented Hitachi Data Systems' AMS500 modular storage system. It has 4Gbit/sec. Fibre Channel port connectivity in a three-tiered storage model for the high-availability clustered servers. The system was tooled on Sun servers, running Sun Solaris 8, with Veritas Storage Foundation software.

First-tier storage, configured as RAID 5, is used for client data and information marts using Fibre Channel running 15,000 rpm for Intellidyn's customer data. The second tier is configured with RAID 5 and midperformance Fibre Channel for client data warehouses that provide historical data snapshots and time-series analysis. Near-line backups to disk are handled by third-tier RAID 6 Serial ATA drives.

RESULTS "I'm doing the same thing in one rack versus what I would've done with three racks. Rack space savings over a three-year period is almost $60,000 per rack," Gagneja says. Add to that about $85,000 in power savings and another $85,000 for support fees, he notes.

Gagneja plans to add virtualization components for disk-based backup this year. "The key factor in the whole solution was the design," Gagneja says. In addition to being scalable enough to handle Intellidyn's growing data requirements, he says, "it has to address the tiered-storage model with integration for future virtualization technologies that we will be rolling out."

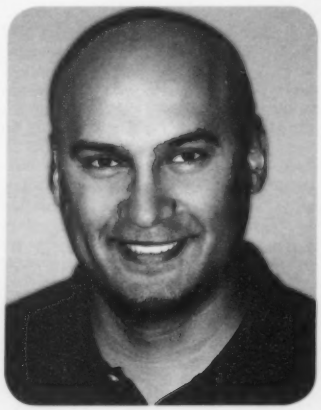
ENERGY-SAVER

CONXERGE
Houston
www.conxerge.com
- **Project lead: Philip Skeete, president and CEO**
- **Approach: A SAN shared-disk system using blade servers to reduce the number of drives being used and decrease the overall power usage.**

››› Philip Skeete never gave much thought to the energy-saving features touted by some storage devices. That is until Skeete, president and CEO of Conxerge, a Houston-based managed services provider, decided to move the company's data storage to a new collocation facility in Dallas.

"The cost of power became more expensive than the cabinet price and the bandwidth put together," Skeete says. The collocation facility charges as much as $20 per amp. With the average storage cabinet requiring at least 30 amps, "you were looking at $600 of power alone per cabinet" each month, Skeete recalls. Multiply that by 50 servers in 10 cabinets, and energy costs could easily reach $3,000 per month.

The company couldn't afford to run underutilized servers in the facility, so Skeete began to look for ways to fully utilize its storage systems. He went with a SAN shared-disk system from EqualLogic Inc., using blade servers from IBM, Hewlett-Packard Co. and Appro International Inc., to reduce the number of drives being used and lower the overall power usage.



> **"We get a much better level of data protection with snapshots and data replication. We can also deploy new blades faster than any other method by simply cloning an existing server.**
>
> **PHILIP SKEETE,** PRESIDENT AND CEO, CONXERGE

RESULTS "If you consider even with the high-density systems we're using, those blade servers each have two drives per blade, 50 blades in a cabinet — that's 100 drives. [With shared disks] we can cut that down to 28 drives to provide storage for that many servers," Skeete says.

What's more, the storage array itself turned out to have very low power consumption during internal tests — about 2 amps, "which is probably about the same as a high-end desktop computer," he adds.

Skeete says he can also boot an entire cabinet of blades from a single EqualLogic array. "We get a much better level of data protection with snapshots and data replication," Skeete says. "We can also deploy new blades faster than any other method by simply cloning an existing server. This takes literally seconds, and the server being cloned doesn't even need to be shut down."

Less power and fewer disks and servers has cut Conxerge's power consumption 40% to 70%, he says, for an annual energy savings of $2,100 per rack. ›

Collett is a Computerworld *contributing writer. Contact her at stcollett@aol.com.*

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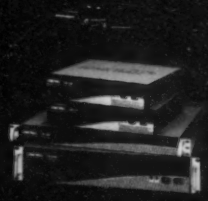

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The newest storage technologies save both energy and space. **By Mary K. Pratt**

Next-Gen Storage

IT'S A SIMPLE EQUATION: As data storage needs grow, so do storage costs. In fact, even as prices continue to come down, storage equipment now accounts for 19% of the IT hardware budget, according to a report from Cambridge, Mass.-based Forrester Research Inc. And that figure doesn't include costs such as energy and management.

"Disk might be cheap, but storing the increasingly high volumes of data that companies generate isn't. It's actually quite expensive," says Forrester analyst Andrew Reichman.

And as the costs for physical space and energy (for both powering up and cooling down the hardware) continue to rise, storage efficiency will become a higher priority. Here are four next-generation technologies that could help.

SOLID-STATE DISK/ FLASH TECHNOLOGY

DEFINITION: Data storage devices that rely on nonvolatile memory, such as NAND flash, rather than spinning platters and mechanical magnetic heads found in hard disk drives. Vendors include Adtron Corp., Samsung Electronics Co. and SanDisk Corp.

>>> Until recently, solid-state disk found its home in niche markets where the need for speed outweighed cost concerns. But like other storage options, dropping prices and technology advances have increased interest.

Samsung is testing its 16-gigabit NAND flash memory with customers.

"Cost is always going to be the driver here," says Dave Russell, an analyst at Gartner Inc. "The cost is coming down, and to the extent that holds true, that is going to help the market really take off."

That price drop has been steep: Solid-state disk prices fell 66% in 2006 and are expected to drop another 60% this year, according to Gartner analyst Joseph Unsworth. Yet hard drives are still far cheaper, Unsworth notes, and because of that, deployments of solid-state disk have been limited, usually to specialized uses in industrial, military and aerospace organizations.

Solid-state disk has been around for well over a decade, says Mike Karp, an analyst at Enterprise Management Associates Inc. in Boulder, Colo. It looks like a regular disk, but without the characteristic spinning motion. And because there are no moving parts, it's faster, he says. It also requires less energy, although Karp says energy savings are a minor part of the cost equation. Because organizations don't have large-scale deployments of this technology, they won't see large-scale energy savings, either, he says.

But the use of NAND flash technology with solid-state disk could edge up the number and types of deployments, extending the technology beyond enterprise storage for use in laptops, for example. Unsworth estimates that solid-state disk with NAND flash technology could mean a 5% to 10% energy savings over a conventional notebook hard drive; it also offers faster performance in a smaller space.

"It could be important in ultraportable notebooks, but it's not an advantage in desktop systems," Unsworth says. "It's still a very niche market because of cost. Right now, consumers and IT managers don't know why they should pay a premium for such technology."

HIGH-DENSITY DISKS

DEFINITION: As their name suggests, high-density disks can hold more data than conventional storage options. They do so by packing more bits into the same space, either by storing bits vertically instead of using the traditional horizontal pattern or by

Continued on page 42

Snapshots

Future of Storage

Which emerging storage technologies are you evaluating or using?

Storage virtualization	44%
IP SANs	43%
Continuous data protection	30%
Solid-state disks	26%
Hybrid hard drives	19%
Holographic storage	4%
Other	8%
None of the above	17%

NOTE: Respondents could choose all that apply.

High Potential

Which emerging storage technology holds the most promise for the future?

Storage virtualization	24%
Don't know/not sure	18%
IP SANs	13%
Solid-state disks	11%
Holographic storage	8%
Continuous data protection	8%
Hybrid hard drives	7%
Storage resource management software	5%
Data de-duplication	4%
Other	2%

NAS Leader

Which technologies do you use now or plan to use in the next 12 months?

Network-attached storage	61%
Fibre Channel SAN	54%
Tape autoloader	49%
Direct-access storage devices	46%
Virtual tape library	32%
Storage resource management software	31%
Storage virtualization	31%
IP SAN	30%
Data de-duplication	21%
Near-line storage	17%
Solid-state disks	14%
Hybrid hard drives	12%
Holographic storage	2%
Don't know/not sure	6%

NOTE: Respondents could choose all that apply.

SOURCE FOR ALL CHARTS: EXCLUSIVE COMPUTERWORLD SURVEY OF 121 IT EXECUTIVES, FEBRUARY 2007

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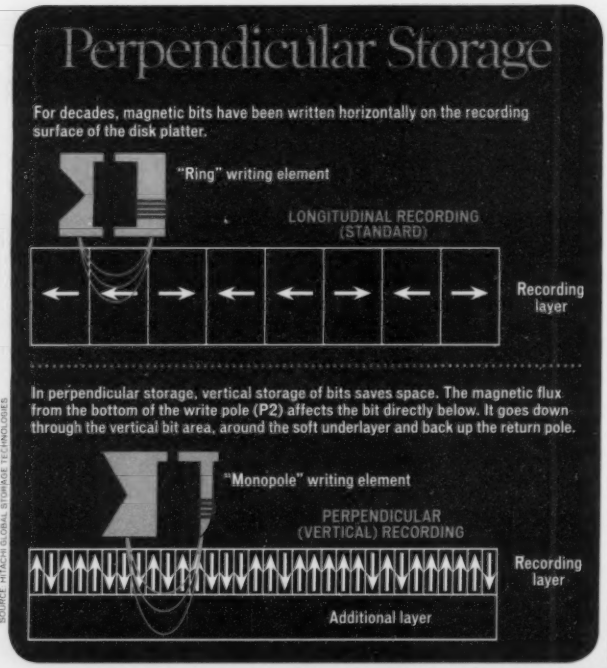

Perpendicular Storage
For decades, magnetic bits have been written horizontally on the recording surface of the disk platter.
"Ring" writing element
LONGITUDINAL RECORDING (STANDARD)
Recording layer
In perpendicular storage, vertical storage of bits saves space. The magnetic flux from the bottom of the write pole (P2) affects the bit directly below. It goes down through the vertical bit area, around the soft underlayer and back up the return pole.
"Monopole" writing element
PERPENDICULAR (VERTICAL) RECORDING
Recording layer
Additional layer
SOURCE: HITACHI GLOBAL STORAGE TECHNOLOGIES

"Disk might be cheap, but storing the increasingly high volumes of data that companies generate isn't. It's actually quite expensive."

ANDREW REICHMAN, ANALYST, FORRESTER RESEARCH INC.

Continued from page 40

storing information using three dimensions, creating a hologram read by laser. Vendors include Seagate Technology LLC and Hitachi Global Storage Technologies.

>>> Higher density represents the next step in the evolution of storage, with perpendicular storage and holographic storage giving IT managers new options.

"They're increasing the density per square inch, which to the end user increases the space and price efficiency of the solutions," says Brian L. Garrett, an analyst at Enterprise Strategy Group Inc. in Milford, Mass.

Perpendicular storage takes areal density and increases it by layering the bits vertically, says Karp. "Bits actually do have physical length, so instead of lying down, you stand them up on the disks," he explains (see diagram at left).

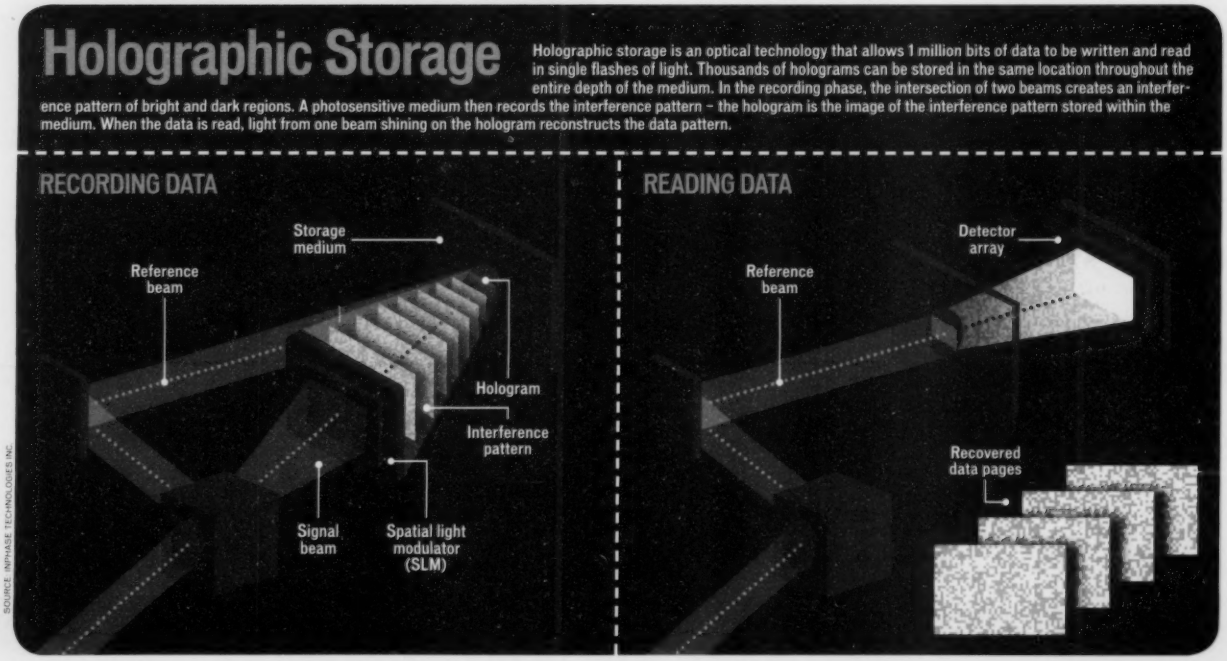
The potential savings with this technology are high, says Dianne McAdam, a consultant at The Clipper Group Inc. in Wellesley, Mass. Perpendicular storage promises to increase storage in the same physical space by a factor of 10, she says. "That's going to save on space, because we're storing much more information in the same footprint," McAdam says. "It also saves on energy, because we'll need one-tenth the number of disk drives to store the same amount."

Similarly, holographic storage promises to pack more into a smaller space by moving storage from 2-D to 3-D (see diagram below). "You start to look at [them, not as] bits on a surface, but as being a cube. If you look at things in two dimensions, you have an *x* and *y* axis. But in three dimensions, you have not only the *x* and *y* axis, but a *z* axis, too," Karp explains.

Holographic storage might sound like the stuff of science fiction, and to some degree it still is, Karp says. "It's very interesting in terms of its potential," he says, but he adds that it's still a ways away from full commercial deployment.

One of the few holographic storage

Continued on page 44


Holographic Storage
Holographic storage is an optical technology that allows 1 million bits of data to be written and read in single flashes of light. Thousands of holograms can be stored in the same location throughout the entire depth of the medium. In the recording phase, the intersection of two beams creates an interference pattern of bright and dark regions. A photosensitive medium then records the interference pattern – the hologram is the image of the interference pattern stored within the medium. When the data is read, light from one beam shining on the hologram reconstructs the data pattern.
RECORDING DATA
Storage medium
Reference beam
Hologram
Interference pattern
Signal beam
Spatial light modulator (SLM)
READING DATA
Detector array
Reference beam
Recovered data pages
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Continued from page 42

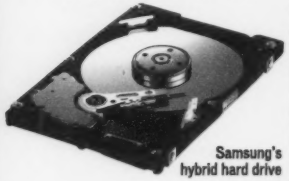
devices currently on the market is the Tapestry 300R from InPhase Technologies Inc. in Longmont, Colo. The drive costs $18,000, and the 1.5mm-thick platters are $180 apiece.

HYBRID HARD DRIVES

DEFINITION: These use nonvolatile flash memory as a large buffer to cache data before storing it on a traditional spinning drive, allowing the platters on the hard drive to rest most of the time. Vendors include Seagate and Samsung.

››› Hybrid hard drives are another evolutionary step in storage that could bring some important savings to IT organizations.

The concept is fairly straightforward: "It's sort of cache memory attached to a hard disk drive," McAdam says, noting that she sees a future for this technology not only in laptops and desktops, but also in enterprise systems.



Samsung's hybrid hard drive

Data will write to a cache memory and, when the cache fills up, move to a hard drive. That concept isn't new. Hard drives already have a buffer, says Garrett. But those buffers are in the 4MB to 8MB range; with hybrid hard drives, the buffer can reach 1GB. "It's just a larger buffer, and it's nonvolatile," Garrett explains.

Like other advances in storage technology, hybrid hard drives could save energy and space. It takes energy to power up and keep disks spinning, McAdam says. Because all that spinning creates heat, the disks then need to be cooled. In hybrid disk drives, the hard drive is spun down; in other words, the disk stops spinning, so it requires less energy.

"If the disks aren't spinning [all the time], it costs less to power, and you can pack more disks more closely together because they don't generate as much heat," says Russell.

Analysts aren't ready to quantify how much money this technology may save, however. "It's still too new, and we don't have all the specs on this," McAdam says. "They're just coming to market now."

Moreover, McAdam sees some circumstances where

> **If the disks aren't spinning [all the time], it costs less to power, and you can pack more disks more closely together because they don't generate as much heat.**
>
> **DAVE RUSSELL**, ANALYST, GARTNER INC.

We have a word for those who think there's some radically better way to manage data.

this technology could require more power than conventional disks do. "If for some reason you have to keep powering this thing up and down and up and down, you may not be able to see some savings," she says.

STORAGE RESOURCE MANAGEMENT SOFTWARE

DEFINITION: It provides a centralized view of a company's storage environment. The software enables better control, management and provisioning of, as well as more accurate reporting on, storage resources. Vendors include EMC Corp., Hewlett-Packard Co. and Symantec Corp.

>>> For many organizations, stored data is something of a black hole: It keeps expanding, and no one has a complete understanding of what it holds.

In fact, the average utilization rate of storage capacity is 40% to 50%, Russell says.

"No one thinks we should run at 100% — you want to have some reserves. But running at 80% to 90% would have enormous savings in utility costs and floor space," he says.

Storage resource management software can help organizations reach that target, says Russell. "It's about optimizing what you have and delaying future investments. There will be a time when you'll have to add more resources but you'd like to get more out of what you've already deployed," he says.

This software looks at all storage in a company and allows it to be managed as one pool, McAdam says. "With this software, because we virtualize how it looks, we can drive up utilization. If we drive up utilization, we can get away with less physical storage."

"The potential is huge," adds Reichman. Bumping up utilization just 10% could translate into a 10TB reduction in the storage capacity needed. And at a cost of $70,000 per terabyte for high-class storage, that's a $700,000 savings.

Storage resource management software offers a broad range of capabilities, including provisioning, capacity planning and performance management, says Bob Laliberte, an analyst at Enterprise Strategy Group. The software used to just focus on the storage array, he says, "but what you're seeing these days is more of an emphasis on looking at the whole stack." Some analysts have also lobbied to expand the term to include something such as infrastructure resource management or infrastructure services management.

But Laliberte says IT shops are interested in capacity planning to improve their use of storage they've already deployed. "The larger, more complex environments will get more value from this," he says. "You could be saving millions of dollars a year — especially the larger shops. But really, any size company can benefit from what this has to offer."

Pratt is a Computerworld *contributing writer in Waltham, Mass. Contact her at marykpratt@verizon.net.*

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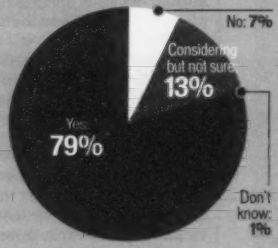
Snapshots

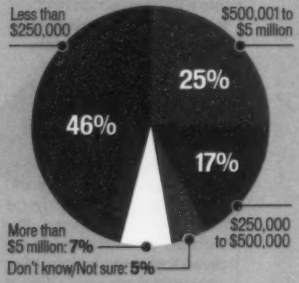
Cost of Doing Business

Does your company plan to purchase storage products or services in the next 12 months?



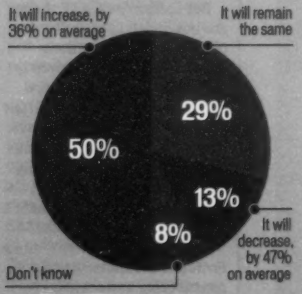
Under a Quarter Million

How much does your company plan to spend on storage hardware and software in the next 12 months?



Ready to Spend

Will the amount your company spends on storage hardware and software increase, decrease or stay the same compared with the previous year?



SOURCE FOR ALL CHARTS: EXCLUSIVE COMPUTERWORLD SURVEY OF 121 IT EXECUTIVES, FEBRUARY 2007

MARK HALL

More Data? Get Used to It

AS PART OF the IT team at the Virginia State Police department, Lt. Pete Fagan's job is to ensure that criminal investigators, police officers in the field and other authorities get the most accurate, timely and detailed crime-related information possible. Crime never stops, so the data volumes are huge, dynamic and getting bigger every day. Criminal records often stretch back decades and include source material from countless systems in myriad formats. Multimedia content is a growing necessity. Metadata, a new necessity, is gobbling up precious disk space. Storage capacity, as you might imagine, is an ongoing problem for the department.

But that's not the half of it.

You see, Fagan's goal is to record every request for information on the police department's storage-area network. Not just a log notation of the request, but the entire transaction as it happened. According to the lieutenant, the system will store everything the requestor sees at the moment the request is fulfilled. If the requestor gets to view dozens of JPEGs, MP3 files, videos and other capacity-hogging content, Fagan wants all that information stored separately from the original data store.

Fagan isn't a data pack rat. He's simply doing his job with the tools at hand. For him, information in the moment, knowing exactly what was known and when, could prove crucial to the criminal justice process. Just having the most recent files won't do, because some criminal cases can hinge on when something was known and by whom. Because those criminal files are always in flux, Fagan needs a storage system that can function as a time machine to retrieve not just a facsimile of the past, but the actual files and data from another time. And he needs to store those exact past experiences for more than 300 million requests per year.

MARK HALL is a Computerworld editor at large. Contact him at mark_hall@computerworld.com

Fagan's time machine is emblematic of an impending storage crisis facing IT. More broadly, will it be a harbinger of loftier roles for CIOs? Or will it — and projects like it — ultimately condemn IT executives to being perceived as technologists with tactical, not strategic, value to the business?

Content Explosion

The Virginia State Police department is in the midst of updating its 1TB storage infrastructure with new gear from Fujitsu to handle the estimated 11TB of data capacity that will be needed in the near future. While 11TB pales in comparison with the petabyte of data stored on average by Fortune 1,000 companies, the department's growth rate is much faster than larger organizations'. That puts it in the middle of the inexorable march to the global zettabyte storage requirement. According to an IDC study, 161 exabytes of digital information were created and stored worldwide last year. (An exabyte, you'll recall, is 1 billion gigabytes.) IDC projects that by 2010, global data creation and storage will reach 988 exabytes, a mere 12 billion gigabytes shy of a zettabyte.

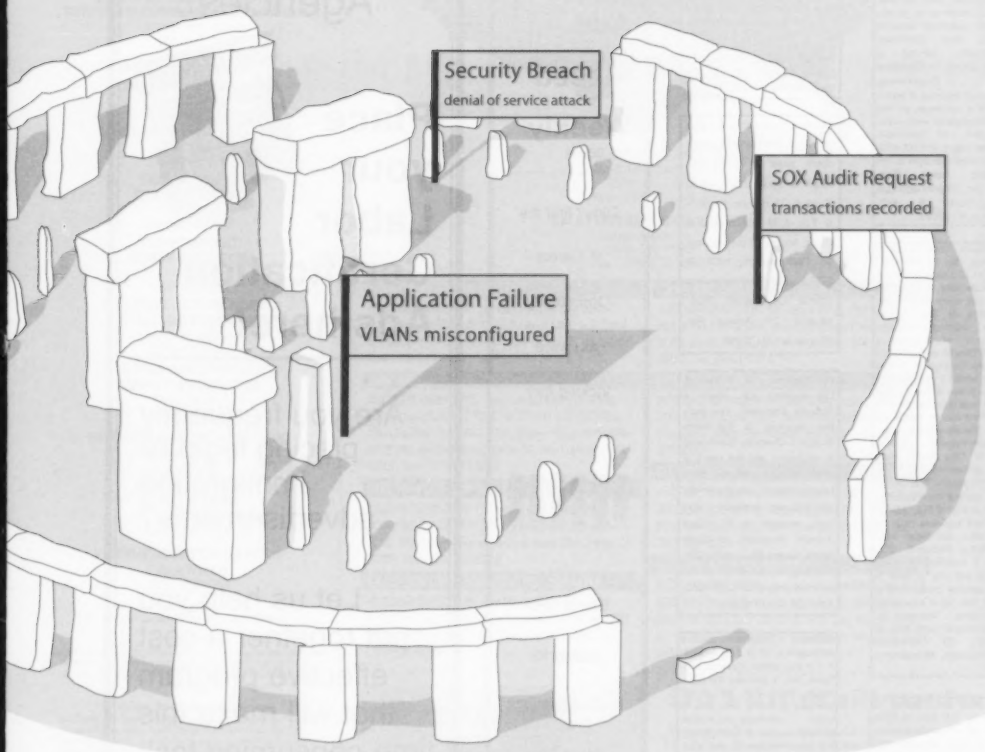
When *Computerworld.com*'s Lucas Mearian reported on the IDC study, he wrote, "The data explosion means the role of IT managers will expand considerably." The IDC report happened to be funded by EMC, and when I chatted about it with EMC executive Chuck Hollis, he speculated that a savvy CIO can take this growth as an opportunity to become "less of a technologist and more of an informationist." He argued that IT leaders can emerge as the primary arbiters of information standards and processes for companies — much like CFOs raised themselves from lowly accountants to powerful executives sitting at the right hand of the CEO.

Wish it were true.

Even if IDC is right about storage demands skyrocketing in the next three years, you won't see CIOs casting a strategic eye on their companies' information policies or dictating data-retention policies to their business units. Instead, they'll be running around with their hair on fire trying to keep up with the ever-increasing amounts of information pouring into their shrinking corporate SANs. Oh sure, the CIO can outlaw certain file types or act as a trusted adviser who shows business leaders how to approach information life-cycle management. But a storage capacity crisis won't enhance IT's reputation. It will undermine it.

The only way CIOs will improve their standing during a global storage shortage is to ensure that their businesses don't suffer from it. I don't care how clever a CIO thinks a new information management scheme might be or how powerful he thinks it will make him. Such an approach will be meaningless to people like Lt. Fagan, who need data to do their jobs. And I wouldn't want to be the IT executive who tries to force a new storage policy on Fagan. After all, the lieutenant does carry a gun.

Witness network history.



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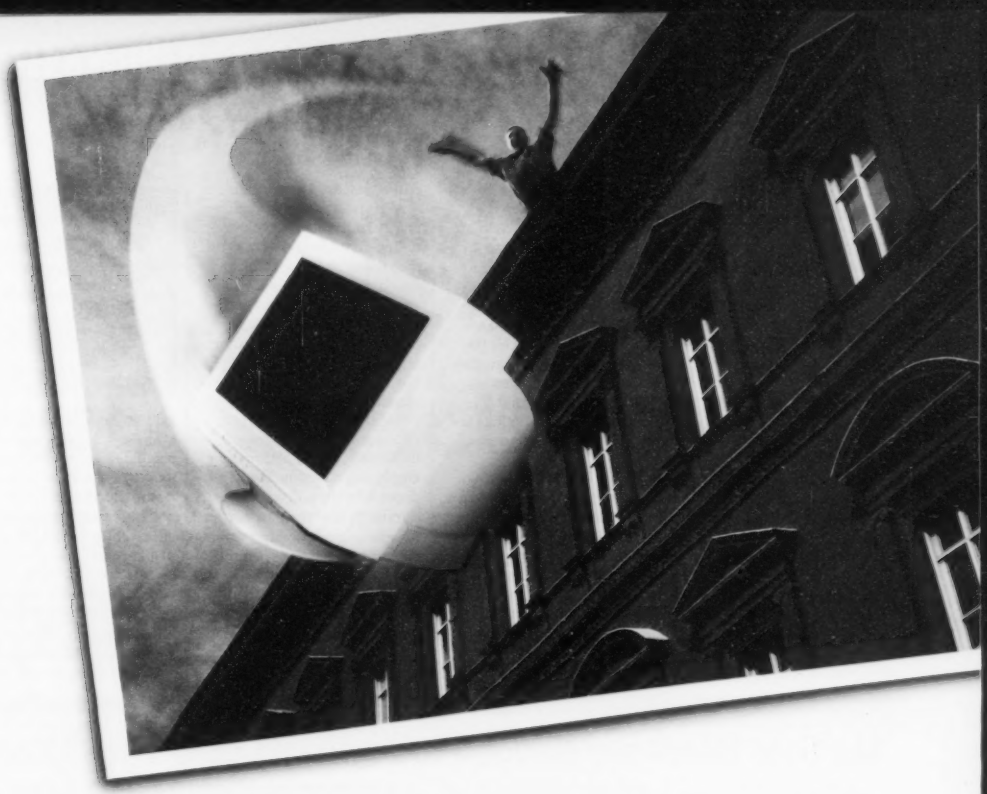

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SHARK BAIT

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ANI Patch

"Anytime you're patching, there are many different factors that come into play," he said. "But 100 days in today's climate is unacceptable. It's really not quick enough."

Developing patches is "all about prioritization," said Amol Sarwate, manager of the vulnerability lab at Redwood Shores, Calif.-based security software vendor Qualys Inc. "But in this case, they obviously didn't think that this was a big enough issue until it was actually being exploited."

Mark Miller, director of the Microsoft Security Response Center, rejected the notion that the software vendor rushed to release the ANI fix only when exploits appeared and publicity mounted.

"Engineering a patch is a long, complex process," Miller said. He noted that by mid-March, when Microsoft skipped its usual monthly software update release, the company had completed an investigation of the ANI flaw and created a patch. "But it was still undergoing testing," Miller said, adding that Microsoft planned to include the patch in its April updates.

Attacks Spotted

On March 28, though, McAfee Inc. notified Microsoft that it had spotted attacks exploiting the cursor flaw. Last Monday, as attackers ramped up the exploit attempts to include hundreds of malicious Web sites, Microsoft promised to issue a patch a week ahead of the other April fixes, which will be released tomorrow.

Alexander Sotirov, a vulnerability researcher at Determina Inc. in Redwood City, Calif., who found the flaw, refused to criticize Microsoft for the time it needed to create a fix.

"If you look at the average time it takes them, this vulnerability is not an exception," Sotirov said. "In fact, it's pretty standard."

But the fact that the ANI vulnerability was discovered by Sotirov, not by a Microsoft employee, raises questions about why the software vendor didn't spot the flaw earlier. Several security analysts and researchers have noted similarities between the ANI flaw and an earlier one involving animated cursors that Microsoft patched in January 2005.

"We're doing an analysis of why we didn't find it then," said Miller, who added that Microsoft devotes some of the patch development process to looking for similar vulnerabilities in the affected code.

> **"If you look at the average time it takes them, this vulnerability is not an exception."**
>
> ALEXANDER SOTIROV, VULNERABILITY RESEARCHER, DETERMINA INC.

"This reinforces the idea that vulnerability research is more of an art and less of a science," Friedrichs said. "Microsoft's people could have looked at this code and seen nothing, but all it takes is someone who sees things a bit differently."

Nonetheless, he said that he views the inability of the software vendor to find the ANI flaw two years ago as "somewhat of a failure on Microsoft's part."

Despite all the hoopla, the vulnerability "ultimately wasn't a big issue" for Online Resources, McArthur said. But he added that the online bill-processing company treated the threat "very seriously" and made sure that its antivirus software was up to date and that its monitoring tools were configured to detect any exploit attempts on its systems.

Jordan said that having to install the out-of-cycle patch — just the third released by Microsoft in more than two years — was "an inconvenience" for Arlington County's IT staff. But, he said, the flaw didn't pose any immediate threats to the county's systems.

Multiple Defenses Needed to Fight Off Zero-Day Attacks, Say Experts

THE WINDOWS animated cursor flaw that Microsoft patched last week caused widespread concern because attempted exploits of it were unleashed before the patch became available. But there are a variety of steps that companies can take to try to mitigate the risks posed by the ANI vulnerability and other so-called zero-day security threats.

The available measures aren't a sure bet, IT managers and security analysts cautioned. They added that in the end, patching a flaw is still the most reliable way of protecting systems against attackers who are seeking to take advantage of it. But deploying multiple layers of defenses is a vital element of strategies for dealing with threats for which no immediate fix is available.

For instance, Lloyd Hession, chief security officer at New York-based BT Radianz, said his company is using software from ConSentry Networks Inc. that can quickly detect compromised systems by any anomalous behavior they exhibit, instead of trying to spot infections solely by looking for virus signatures on machines.

"You need to smarten the intelligence within the local network," said Hession, who added that the ConSentry tool lets IT staffers at BT Radianz control the connections PCs can make with other systems. He said that can help lower the risk that an infected computer will spread malware across a LAN at the company, which provides telecommunications services to financial firms.

"Under the previous model, you could go anywhere in the network once you were within the network," Hession said. Now there are automated rules specifying the portions of a network that systems are allowed to access. The rules also limit the other machines that PCs can connect to based on the business needs of end users, he said.

Another way to minimize zero-day threats is to adopt strict policies for filtering out e-mail attachments, which attackers often use to try to deliver malware to unsuspecting end users.

Analysts have long advised companies to filter out GIFs, JPEGs, WMVs and other unneeded attachment types from inbound and outbound e-mails. And when deciding which attachments to allow and which to block, it's a mistake to assume that only certain types are being used maliciously, said Russ Cooper, senior information security analyst at Cybertrust Inc., a security services firm in Herndon, Va.

Additional Protections

Security analysts also suggested the following measures for blocking exploits of unpatched vulnerabilities:

- **Turn off JavaScript to prevent some Web-embedded exploits from reaching end users via their browsers.**
- **Restrict administrative privileges to stop remote hackers from gaining full administrative control of systems.**
- **Use updated virus signatures to identify possible attacks from remote sites and initiate responses.**

Cooper noted that both GIFs and JPEGs were considered benign until attackers started hiding malicious code in them. "Don't go on the basis of whether something is benign or not," he said. "Look at what you need for your business."

Malicious hackers also like to use HTML e-mail because it lets them more easily hide and deliver attack code to systems. For instance, several of Microsoft's e-mail clients, including Outlook Express and Windows Mail for Vista, are vulnerable to attacks that insert a malicious ANI file in an HTML message. Disabling HTML e-mail on systems can help mitigate that risk and blunt many of the phishing attacks that attempt to get users to click on links to malicious Web sites, Cooper said.

It's also important to keep an eye on the traffic that's leaving your network. Many Trojan horses and bot programs communicate with remote systems to get instructions on what to do next or what information they should upload. Using outbound proxies or firewalls to look for and block such communications could prevent malware programs from calling home, said Johannes Ullrich, chief technology officer at the SANS Institute's Internet Storm Center in Bethesda, Md.

Companies should also consider implementing a "default deny" capability at the perimeter of their networks, Cooper said. The idea behind that approach is to allow only specific traffic in and out of a network gateway while blocking everything else by default.

Cooper said that to determine what traffic should be permitted to enter and leave a network, IT managers can log all inbound and outbound router activity for a period of time to get a picture of what is routinely being transmitted. "If you're worried about breaking functionality, allow everything that has been going through anyway, and deny everything else," he said. "It's a great starting point."

Increasingly, though, Trojan horses and bot programs are using trusted network ports such as Port 80 and Port 443, which are used by HTTP and HTTPS traffic, respectively, to communicate with the remote systems controlling them. That makes it harder to detect the illicit traffic using outbound filtering, Hession said.

– JAIKUMAR VIJAYAN

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FRANK HAYES ■ FRANKLY SPEAKING

H-1Bs and Students

NO SURPRISE HERE: Last week was the start of H-1B application season. And as expected, the U.S. Citizenship and Immigration Services bagged the 65,000-visa limit by lunchtime. Actually, the agency got about 150,000 applications on the first day; 65,000 lucky winners will be randomly selected to receive high-tech guest worker visas on Oct. 1.

And there'll be no surprise about the screaming that will start next. Big IT companies will wail that with U.S. computer science enrollments dropping, they need more imported help. IT worker advocates will howl that IT guest workers and offshoring are the things that are driving students away from IT careers.

But when we look at hard numbers — now *there's* a surprise.

It turns out that the much-lamented decline in CS students maps almost exactly to the dot-com boom and bust — which matches up pretty closely with actual IT industry employment. H-1B visas and outsourcing appear to have nothing to do with it.

Want proof? Let's crunch some numbers. We can start with students who want to get undergraduate CS degrees. According to freshly updated statistics from the Higher Education Research Institute at UCLA, interest in CS as a major was flat at U.S. colleges until about 1994. Then it took off like a rocket, reaching a peak in 2000. That's right — as the Internet soared, so did the number of kids who wanted a piece of that action.

Then, as the dot-com economy fell off a cliff, so did CS's popularity as a major. By 2004, it was back down to preboom levels.

What about the actual number of CS degrees? That's tracked by both the National Science Foundation and the Computing Research Association. Those numbers were flat at about 25,000 college CS degrees per year until 1998 — exactly four years after interest in CS majors started to climb. And did they ever climb. Undergrad CS degrees peaked at a spectacular 57,400 in 2004 — exactly four years after the top of the CS and dot-com bubbles.

Since then, the bottom has fallen out — college CS degrees are down 30%. But then, that's about what we'd expect, isn't it?

And notice, those college kids didn't abandon IT as a career even amid a faltering economy, layoffs, outsourcing and a temporarily jacked-up total of 195,000 H-1B visas per year. Once they chose it, they stuck with it. And they kept choosing IT majors until the dot-com bust. After that, they didn't.

What about Ph.D. students — the high-end IT types who compete most directly with H-1B applicants? The number of new CS Ph.D.s in the U.S. actually peaked at nearly 1,000 in 1995, just as dot-coms were taking off, and slid to about 800 in 2002. But that makes sense, doesn't it? Unlike undergrads, wanna-be Ph.D.s can stop studying to grab for a dot-com brass ring — then return to school when the jobs dry up.

And they did. By 2005, CS Ph.D.s climbed to a record 1,189. Numbers aren't in yet for 2006, but they're expected to reach 1,250.

So much for the idea that nobody in the U.S. is interested in high-end computer science — or that we can't turn out our own Ph.D.s.

And so much for the idea that college students aren't interested in IT. Of course they are. They just need something like the dot-com revolution to fire their imaginations and convince them there's something worth doing in this business.

Sure, H-1B visas and offshoring are hot-button topics today. But they aren't things that push the buttons of the next generation of IT workers.

That's great news if we really want to get more kids interested in IT careers. They won't be scared off by H-1Bs, outsourcing or other things that might make for an iffy employment environment.

But if we can create a genuinely exciting vision for IT — a real reason for college students to sign on — we could have all the CS majors we need.

And four years later, we just might be surprised by the result. ◗

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at **frank_hayes@computerworld.com.**

We Have a Winner!

Boss hands sysadmin pilot fish a network monitoring package that's been sitting on the shelf for a year and tells him to try it out. "I decided to load it on my desktop," says fish. "As instructed in the manual, I started with a process to determine the bandwidth available on the network and the size of the network. Within two minutes, my boss ran into the wire closet and frantically started unplugging every network line while screaming, 'We're under attack! We're under attack!' The activity lights on all six switches were flashing like a slot machine when you hit the jackpot."

SHARK TANK

Who Am I?

This help desk gets a steady stream of users who have forgotten their passwords. "Since the log-on username is normally retained from the last successful log-on, users sometimes even forget that," says a pilot fish on the scene. "With one such caller, after the help desk tech explained that her log-on was her first initial and last name, there was a moment of silence. Then the user responded that this information didn't help; she had been married and divorced so many times that she didn't know which name would apply."

Next Time, Just Call First

Boss's secretary calls the help desk to report that the boss's wireless mouse doesn't work. Support pilot fish has been through this before with his wireless keyboard and mouse – the batteries are probably dead. Did you replace the batteries? fish asks. "Yes," secretary says, "the boss did it before he had me call." And that didn't help? "No, and by the way, we can't find the battery cover for the bottom of the mouse. So we have two problems." Sighs fish, "We bought him another mouse as soon as the computer store opened. So much for self-help."

Dial 555-ESPN

It's the 1980s, and this pilot fish is having trouble with an IBM 3708 network controller. "I had been working with the IBM support center to resolve the problem," fish says. "When I returned to work one morning, the graveyard operator had left a note for me: 'The 3708 sports center called.' "

Colorblind

User: "One of our color printers is low on toner." Help desk pilot fish: Which color do you need? Irritated user: "It doesn't say anything about the color. It just says 'Cyan toner low.' "

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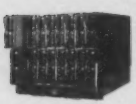

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